The Builder.

VOL. XXX.—No. 1549.

Pollution of Rivers.

LET us speak a little further of the recent Report on the condition of the rivers of Scotland.* The North Esk rises in the Pentland Hills and flows into the sea at Musselburgh. On this river the paper manufacture (chiefly writing and printing paper) is carried on largely. Between Dalkeith, which is a few miles above Musselburgh, and Penicuik, which is situated about the centre of the river basin, the distance being about eight miles in a straight line and twelve by the river, there are eight paper-mills, employing 1,600 persons, and making 8,000 tons of paper in a year from 3,000 tons of rags and 8,000 tons of esparto grass. These mills use for power, besides that of the water of the river, 50,000 tons of coal in a year (1870). The Commissioners say: — "The North Esk is one of the few rivers in Scotland on which attempts have been made by manufacturers to supply the natural want of water in the summer time by the provision of upland storage reservoirs." The North Esk reservoir, situated nearly at the river head, was constructed twenty-five years ago by the paper-makers on this river at a cost of 14,000*l.*, Messrs. David & Thomas Stevenson, of Edinburgh, being the engineers. It holds 24,133,700 cubic feet of water, and is fed by a gathering ground of 1,760 acres. This, it is stated, is sufficient to give more than 200 cubic feet per minute to the mills during a period of three months,—a contribution which, when the minimum flow of the river without this aid falls to 80 cubic feet per minute, is of the greatest value.

The Water of Leith rises in the Pentland Hills, and is a smaller stream than the North Esk. Almost the only pollution it receives is the brown and frothy drainage from paper-mills, of which there are seven on the stream. Compared with the water of the North Esk at Dalkeith, it contains about six times as large a proportion of polluting matters. At five of these mills 386 hands are employed, 1,160 tons of rags are used in a year (1870), and 4,172 tons of esparto grass; the produce of paper being 4,070 tons, with a consumption of coal of 17,100 tons. Both here and on the North Esk, as well as in England, the rags and esparto grass are each boiled for several hours in a strong solution of caustic soda.

"During this operation the soda combines with silica and with resinous matters to form soapy compounds, and the causticity of the alkaline ley is destroyed. The digestion is carried on in large wrought-iron boilers. Heat is applied by means of free high-pressure steam, by which a temperature considerably above that of boiling water is obtained. The highly polluting liquid resulting from this process is technically termed 'boilings.' It is dark brown approaching to a black colour, and is so soapy in its nature that one volume of it added to 2,000 volumes of pure water produces on agitation an extremely persistent lather or froth. After the boilings have been drained off, cold water is injected into the boilers for the purpose of cooling and partially washing the fibrous materials. This water becomes, of course, greatly polluted by the residue of the boilings, which remains soaked in the rag or esparto fibre even after the most effective drainage. This liquid, when drained off, constitutes what is known under the name of 'coolings.' The next process consists of washing and 'breaking in' or 'pulping' of the boiled rags or esparto. The quantity of water employed for every ton of esparto grass varies from 3,500 to 12,000 gallons. A very large volume of more or less polluting liquid known as 'washings' results from this treatment of the fibre. Rags require a greater quantity of water. Washings contain a very much smaller proportion of mineral and organic matters in solution than boilings, but they hold a much larger proportion of organic matter in suspension. . . . . As the greater part of the organic matter in suspension is useful fibre, the manufacturer suffers a great loss when he allows this polluting liquid to be discharged into a river or stream without purification."

On the river Almond, the drainage area of which is similar in extent to that of the Esk, the great paraffine-oil works are situated. Young's Paraffine Light and Mineral Oil Company employ 1,200 hands; operate on 370,000 tons of shale annually; use 7,700 tons of sulphuric acid, 1,360 tons of caustic soda and other alkalies; produce 270,000 gallons of naphtha, 2,300 tons of crude paraffine, 422,000 gallons of lubricating oil, and 3,785,000 gallons of illuminating oil, besides 700 tons of sulphate of ammonia; and burn 113,000 tons of coal a year. Three other works together operate on about half as much shale, their chief produce being crude paraffine, of which they make about 600,000 gallons a year. Paraffine and petroleum oils, it is said, furnish a given amount of light as cheaply as it can be obtained from good cannel gas, and much more cheaply than it can be got from coal gas. Except that which comes from the petroleum-wells of Canada and the United States, the source from which it is got is the cannel or bituminous shale, and

"The first process in the manufacture consists in heating this shale to dull redness in cast-iron retorts. The volatile products are condensed in appropriate refrigerators, and constitute crude paraffine oil, which, mixed with condensed water, runs into the tar-reservoir. From this the warm liquid is pumped into stills, where it is submitted to a current of steam, by which a very volatile spirit or naphtha is distilled off. The residual oil is then run into the water-separating apparatus, consisting of an iron tank, surrounded by a water-jacket, which is kept at a temperature of 60° C. for about ten hours. At the end of this time the water, which forms about one-third of the crude tar, becomes almost completely separated. The tar, thus freed from water, is now placed in immense stills of cast-iron, furnished with the necessary condensing apparatus. The distillation is carried on until nothing but a kind of coke remains in the still. The coke is of good quality, and is used as fuel. The distillation is transferred to wrought-iron tanks lined with lead, where it is vigorously agitated with sulphuric acid. This operation renders the oil very black, and at its conclusion the sulphuric acid subsides to the bottom of the vat, and can be run off through a cock provided for that purpose. After being washed with water, the oil is next thoroughly agitated with a strong solution of caustic soda. On being then allowed to stand at rest, the oil (now of a light yellow colour) floats above the solution of caustic soda, whilst a thin black layer of tarry matter takes up its position between the two. The purified oily layer is now submitted to distillation, when three products are successively condensed in the refrigerator, in the following order:— 1. Illuminating oil; 2. Lubricating oil; 3. Crude paraffine. All these, with the naphtha already mentioned, are marketable products, the crude paraffine being sold to the paraffine-refiner or candle manufacturer."

The manufacture of textile fabrics from flax and jute has received very extensive development in Scotland. The Avon and the Almond, in the basin of the river Forth, are in the autumn months injuriously polluted by the water in which flax has been steeped. Several hundred acres of flax are grown within the area drained by these streams, most of the farms in the upper part of the valley having a field or two. "The process of steeping consists simply in placing the sheaves in a pit filled with water, loading them so that they shall sink beneath the surface long enough to cause the partial putrefaction of the stem, or of those softer portions of it which hold its fibre and its woody part together. When this process is completed, the sheaves of flax are taken out and spread abroad to dry, after which the stem is broken, and the fibre is then scutched free of it." About 250,000 sheaves are annually grown in these valleys.

"Some of the upland streams running into both the Avon and the Almond are entirely spoiled for several weeks every year by this extremely filthy waste, which, being much stronger in fertilising matter than average town sewage, and more than twice as strong in polluting ingredients, ought not to be allowed to escape from the farm on which it is produced. There is ample evidence of the agricultural value of this liquid manure thus wasted; and there is ample evidence of the power of soil and plants to cleanse and defecate such extremely offensive stuff."

As to the pollution of the rivers by town sewage the Commissioners still hold to the system of irrigation of land as being the best remedy where land can be had for the purpose, but they are confirmed, they think, in the opinion they formerly expressed, that where land cannot be had of sufficient extent for broad irrigation the system of intermittent filtration is to be recommended, based upon the experience that has since been had on twenty acres of land at Merthyr Tydfil. Every one loves his own production, and Dr. Frankland first suggested this method, after experiments in the laboratory, as those know who have read the *Builder*. Knowing something of the Merthyr drainage, there has often seemed to us a want of candour on the part of some of the advocates of this system (not, however, Mr. Denton) in keeping back the fact that the so-called sewage there dealt with is far from being equal to ordinary sewage in the quantity of polluting matter. Merthyr is often spoken of as being a town with a population of 50,000, the sewage of which is purified on twenty acres of ground; but it is not always at the same time said that not much more than one-third of the houses are connected with the sewers. This is recognised by the Commissioners, and they state that "it must not be forgotten, however, in taking the Merthyr Tydfil intermittent works as a model for other localities, that the sewage of this town is exceptionally weak as compared with that of other towns, the Local Board of Health being restrained by injunction from connecting the drainage of a large number of houses with the sewers." The objection we have to the system, so far as it goes, is that it wastes fertilising matter; and that, being a cheap process in the first instance, local Boards may for this reason be led to adopt it in places where, on a better consideration of the whole question, a more advantageous system might be adopted. There has been some return in crops at Merthyr from each of the small number of acres cultivated; but it is inherent in the system that, because the acres are so few, the manure cannot be applied to the best advantage.

ON SHADOW.

IT must be due rather to the influence of Italian painters and Italian writers on art, than to any want of richness in the English language, that the word *chiaroscuro* has obtained a half-recognised naturalisation among us. It has, indeed, the great advantage of being one with which a plain man is not unavoidably familiar, and thus one of which the judicious use, in order to produce an impression of the learning of the speaker, is a godsend to amateur critics. In M. Rigaud's translation of Leonardo da Vinci's Treatise on Painting, the term is defined as the correct distribution of lights and shades; but the chapter which deals with the subject is headed, in good plain English, "Light and Shadow."

Shadow differs from shade in its greater individuality. Thus, we may have a lighter or a darker shadow, but it must be cast by a definite object. Shade, on the other hand, is sometimes used to denote tint, as in different shades of blue or of red, and sometimes to comprehend shadow, or a group of shadows. The leaves of a wood cast a shade beneath the trees; but each tree, or each leaf, if it stands directly in the sunlight, will cast a definite shadow. The arrest of a direct ray of light is necessary to this end

* See p. 779, *ante*.

When a mist covers the face of the sun, a shade is cast over the landscape. But a flying cloud casts its own fugitive shadow; and when the sun emerges from obscurity, the shadow of the observer is projected at once by the sunbeam.

The mastery of light and shadow forms one main section of the power of the artist. It has been, consequently, often dealt with, in lectures and works on art. But the point on which we now wish to dwell is this,—the painter has a special advantage, in being able to use different colours. The effect of simple light and shadow, or of what we call monochromatic work, is less powerful than is that of rich and harmonious colouring. But the work of the sculptor, regarded, not as it leaves his hand, but as it produces an effect on the eye, depends almost entirely on shadow.

It is true that this is not the ordinary distinction that is drawn between these two sister arts. We are accustomed to be told that sculpture regards form, and painting regards both colouring and shadow. But, in fact, the definition of form is the object of all art, whether graphic or plastic. The difference between the two is, first, in the way in which that definition is effected; and then, in the way in which it is accentuated or enriched. A fine, delicate outline, such as that which is employed by Moritz Retsch, and with that most graceful draughtsman, forms the whole of his work, is the graphic form which most closely approaches to the outline of sculpture. Such drawing is appropriate either for a sculptor's sketch or for the copying of a statue. But to look at sculpture in outline only, is to lose almost all that gives it power and beauty. The simple black shadow of a face in profile, commonly called a *silhouette*, is that likeness of the person which Lavater considered to be the most characteristic, and thus, physiognomically, the most valuable, that it is possible to take. But a statue seen only in outline, like a face represented in *silhouette*, while possessing a truth of its own, has but a very simple and rudimentary character as a work of art.

The moment that we pass beyond the condition of outline sketch, of *silhouette*, or of sculptured form seen in dark relief, against a light background, it is obvious that the effect of sculpture depends on shadow. In this, it may be, lies the main secret of the grandeur of the art.

If we regard a relief in marble, or the surface of a statue, as distinguished from its linear contour, the effect which is produced on the eye is due to the variously distributed and modulated shadows. The form and depth of these shadows depend on two causes, namely, the modelling, or accentuation, of the surface, and the direction and intensity of the light that falls on it. Thus, in any given case, we may consider the modelling, or sculpture, and the illumination, as functions of one another. If the angle of the latter is varied, a change is produced such as would be effected by a variation of the sculpture, the light being unchanged. It is hardly necessary to attempt to prove a proposition which is so simple and obvious. The most simple experiment will show what is the effect of a change in illumination. Even in the living human figure this may be seen. Without reference to the magic effect of complexion, and the beauty which a delicate proportion of white and of red will throw over the most homely features, let us confine our attention strictly to such an effect as can be produced, either on a live person or on a statue, by a change in the incidence of light. Look, for instance, at any face, when daylight is absent, by a descending light. Then let the person stand before a bright fire, in a room not otherwise lighted. If there be a looking-glass on the chimney-piece, the entire change of expression produced by casting the shadows upwards, instead of downwards, will strike even the most unobservant. Traits of unsuspected power may at times be thus detected. But the usual result of the reversal of illumination is the destruction of any vestige of beauty. We recommend any fair reader who makes the experiment, to make it, in the first instance, alone.

Of the mode in which the Greek sculptors dealt with shadow we are unable to speak with all the precision that is desirable, from the fact that we have no knowledge of the effect of these works *in situ*. It is owing to the vandalism of a Venetian commander that we are unable to compare the illumination of the two companion groups, erected by Phidias on the eastern and the western pediment of the Parthenon. Over each of them was thrown a deep shade from the projection of the cornice, which must have varied with the position of the sun in the heavens. We have ample proof that the subject received careful attention, though no canon or artistic utterance has been committed to writing. The Greek sculptors wrought; they did not write. It is more than probable that it would have been thought impious, or, at all events, an offence against art itself, to commit its secrets to the untrustworthy tell-tale of written speech. With regard to those extremely precise laws which have, within the last few months, been shown to regulate the proportions of statues, hardly a hint is to be found in writing; and what exists is in the pages not of a Greek artist, but of a Roman man of letters.

Among our proofs of the thoroughly truthful manner in which shadow was dealt with by the Greek artists, are the following. The modulation of the human figure, especially of the male figure, was detailed with the utmost minuteness. Such modulation is lost to the eye, unless duly illuminated. The light must fall in a given direction, to give full force and beauty. It may be said that hunger was the great artist that produced this modulation. It is true that at Sparta the young men had to appear periodically before the *ephori*, for personal examination, and that if they showed signs of fat, they were restricted in their allowance of food. But we are not told of such practice out of hardy Sparta. The object there was the maintenance of robust health and well-nerved muscular strength. A beauty of their own attends on these qualities; and that beauty was appreciated and reproduced by the sculptor. In the female form, on the contrary, to which, in modern art, modulation of any delicacy is almost exclusively confined, the Greek view of beauty differed widely from our own. Aristotle vaunts size as the first virtue of woman. A colossal proportion was given to the queen of the gods. Thus, as we find to be the case, in a very exaggerated way, at the present moment in Italy, the women of the Greek artists appear to be better fed than the men. A full, round swell in every limb and every contour; a neck like a tower; powerful arms, that could grasp a weapon; stately legs, that the chase or the dance could not readily tire; a full rotundity of trunk, as well as a graceful swell of the bosom, characterise the female ideal of the Greeks; and the effect of the shadow, either of a form or of drapery, depended on the exact illumination that threw out these healthful charms.

Again, we see, in Greek sculpture, the absence of that expedient, we may almost call it a trick, with the effective force of which we cannot doubt that such masters of the chisel were familiar. In a statue sculptured for no particular object, site, or illumination,—and such is most modern sculpture,—the artist will at times endeavour to compensate for his absence of the former to give an architectural name and proper illumination to his work, by adding something by way of head-dress, that shall give a shadow under any ordinary light. Such, in real life, is the square piece of cloth worn by the Italian Contadine, as a protection from the sun. Its well-defined gloom gives a picturesque effect even to an ordinary face. The same expedient in sculpture, a shadowy hat, a hollow helmet, a mantle folded above the head, has often been introduced, and that with admirable effect. In the hall at Burlington House, which is an admirably-lighted *salon* for the display of sculpture, we have seen an ordinary plaster cast, with a shadowing head-dress, appear a finer piece of sculpture than any marble around it. By the absence of this provision, for producing good effect under casual illumination, the Greeks give us a mark of their care in selecting the light that would be proper for each individual statue.

Again, we have distinct proof that the Greek sculptors wrought their finest works to produce an effect on observers from a fixed and limited point of view. This shows a rigidity of rule more inflexible than the requirements of illumination itself. Shadow, truly regarded, depends on the relative position of the illuminating body and the illuminated surface, not on that of the spectator. If the latter see the figure at all, he sees it as it is actually illuminated. A hundred spectators would see the same shadow. With a perspective view, or where any obstacle to the visual rays intervenes, the case is quite different. There is an eclipse of the moon,—the actual shadow of the earth is thrown on the orb of her satellite. To every observer who can see the moon at all, the magnitude and progress of the eclipse is the same. But an eclipse of the sun is not a shadow thrown on the source of terrestrial light. It is the interposition of the dense body of the moon, which throws, *on the earth*, a limited and fleeting shadow, the exact course of which is predicted, with the utmost accuracy, by the "Nautical Almanack." Our most enlightened astronomers are engaged in the study of tracing the course of these flitting sun-paths back, to the very dawn of history. At no two places,—mathematically speaking, to no two observers,—does an eclipse of the sun appear, at the same moment, identical in its magnitude. For this reason, an observation of a solar eclipse is of so much more determinative value than an observation of a lunar eclipse. The case is more than analogous. If Phidias wrought his masterpieces to be regarded from a restricted point of view, he cannot have neglected the far easier task of working them for a distinct and prescribed illumination.

We will continue the subject in our next issue.

CONCRETE CONSTRUCTIONS AND THE METROPOLITAN BOARD OF WORKS.

The following paper, which has been forwarded by the Board of Works to the district surveyors, although in answer to a special application, will serve to show the views entertained by the Board and their professional advisers on the subject of concrete, and includes other information which may be useful.

It is right to mention that the Board have made a remarkable exemption in the case of one patentee, concerning which other patentees may excusably feel jealous:—

"Whereas, by the Metropolitan Building Act, 1855, it is provided that buildings to which the rules enacted in the schedules in that Act, relative to the construction and materials of walls, are inapplicable, require the special sanction of the Metropolitan Board of Works.

And whereas it has been shown, to the satisfaction of the said Board, that buildings of certain moderate dimensions may be advantageously constructed of Portland cement, or selenitic lime, and similar concrete, compounded with proper attention to the quality of the said cement or lime, and the proportion thereof to the concrete materials, and to the due application of a mould or machine for giving coherence to the work during its progress, together with proper consolidation by ramming and pressure.

And whereas Mr. Philip Brannon, of No. 8, Bouverie-street, in the City of London, on behalf of R. I. Bell, esq., of Bridlington, in Yorkshire, has applied to the said Board for their licence and approval for the use of the said concrete in the construction of certain blocks of sanitary dwellings and buildings at Balliol-square, adjoining Bishop Wilson's Memorial Hall, Islington.

Now, therefore, the Metropolitan Board of Works do hereby approve of and license the use of the aforesaid concrete in the construction of the houses and buildings aforesaid, subject to the conditions following, viz.:—

1. The Portland cement shall be of the very best quality, ground extremely fine, and weighing not less than 112 lb. to the striked bushel, and capable of maintaining a breaking weight of 350 lb. per square inch seven days after being made in a mould, and immersed in water during the interval of seven days. Such test, when necessary, and ordered by the district surveyor, to be made at the works of the Metropolitan Board. When selenitic lime or other substitute for Portland cement is employed, it shall only be on the certificate of approval by the said surveyor.

2. The other materials of the concrete to consist of clean Thames ballast, or of gravel, or crushed slag from furnaces, or smiths' clinkers, or broken glass, crockery, brick-burrs, or small broken stones, or any hard and durable substance; and each to pass through a screen or mesh not exceeding 2 in. diameter. Sand to be added to such materials in the proportion of one to two. All such materials to be perfectly clean, and free from all greasy, loamy, or clayey matter, and, if necessary, to be washed.

3. These materials and cement to be mixed in the proportion of not more than six parts of material as aforesaid by measure, to one part by measure of the best Portland cement.

4. When it is desired to use, instead of Portland cement, selenitic lime, blue lias, or grey lime, then the gaugings shall not be more than one thereof, to five, four, and three of ballast respectively, and not less than such one part shall be ground with burnt clay. And all concrete materials so compounded shall be thoroughly consolidated by treading, ramming, or other pressure, and sustained by the encasing frames, moulds, or clamps, so long as the district surveyor shall direct.

5. In making the concrete, a box, 2 ft. by 4 ft. by 2 ft., or other like proportions, is to be used for the materials, and another box capable of holding one sack or half a sack containing two bushels of the cement. The cement and materials are to be turned over at least three times, and thoroughly mixed together with water.

6. The concrete thus composed is to be laid into the walls of the buildings all round in equal layers, and to be firmly compacted by treading or ramming, and grouted with cement in the proportion of one cement to two of clear, washed, sharp sand, or ground ballast, after each layer, until the walls are completed in height. The grout to be made as mortar first, and then thinned with water to the necessary consistence.

7. The above materials and matters are to be well and thoroughly bound together, and fixed and applied by one or other of the processes now in use for concrete building, so that security shall be provided for the complete coherence of materials and work during its progress, and to guard against the delay, risks, and errors of the work being put up otherwise than by a well-arranged mould or machine.

8. If it be desired to use bricks or broken pavement-stones, or other flatteners and like materials, suitable to be laid in horizontal beds alternately with the concrete layers (which are about 9 in. deep), any such materials shall be firmly bedded, rammed, and grouted, so as to

become one body with and assist in consolidating the walls.

9. Flat roofs, constructed as herein directed, may be formed, provided they are fully protected on all sides with parapets not less than 9 in. thick and 3 ft. high; and in case of such roofs being continuous over any one terrace or block, they need not be subdivided by party-walls carried through the roofs. All such roofs to be properly waterproofed over the cement-work with asphalte or other effective means.

10. All such flat roofs shall be of a thickness proportioned to the area, and be constructed strictly according to the provisions of the patent specification submitted by the said Philip Brannon to this Board, with an embedded sustaining skeleton of iron and strained wire-work, and a sufficiency of wire and fibre tension seams, and wire mingled with the concrete and cement materials to give the utmost tension and transverse strength requisite. Every layer to be properly flushed with grout, and the concrete to be composed and treated as provided for walls.

11. For all such floors, stairs, partitions, or other internal constructions as are not within the provisions of the Building Act, and are made of concreted materials, or of the same combined with embedded iron skeletons, wire, and fibre, as in said patent provided, the builder and owner must be held responsible for the strength and sufficiency thereof, as in ordinary internal constructions.

12. The thicknesses of walls to be equal, at the least, to the thicknesses for brickwork prescribed in the Building Act.

13. Suitable cores to be provided for fireplaces and for connecting them with flues, and also for recesses and flues; or flues may be formed with tubes of earthenware.

14. Door and window frames, if any are employed, shall be built into the walls.

15. No timber will be allowed to be used in the walls of buildings under this licence; but otherwise the rules of the Building Act generally to be observed as in ordinary buildings.

16. Such concrete buildings to be carefully supervised by the district surveyor, and his fees in respect thereof to be one half more than the scheduled fees provided by the Building Act for new buildings or additions. The fees for alterations to be only as scheduled.

17. A clerk of the works, or other foreman, shall be appointed by the architect or builder, subject to the approval of the district surveyor, and have constant inspection of the quality, mixing, and consolidation of the concrete during the progress of the works, to see that the foregoing conditions are faithfully fulfilled, in addition to the supervision by the district surveyor as aforesaid."

ON CONCRETE BUILDINGS.

NORTHERN ARCHITECTURAL ASSOCIATION.

At the quarterly meeting of this Association, held on the 3rd inst. in Newcastle-on-Tyne, the president, Mr. M. Thompson, introduced the subject of concrete buildings. He said he believed architects would have to turn their attention to the adaptability of some new material for buildings, the cost of stone and brick at the present time being so very high. It was the duty of all practising architects to look out for some other substance, the use of which would bring buildings down to a reasonable cost, while, at the same time, they were sufficiently substantial. He did not believe that architects were either educated or employed to spend money, but rather to save it, and therefore it behoved them to look forward and keep up with the times. He had tried concrete in two or three instances in Newcastle, and had found it very much cheaper than either brick or stone. They also attained another object, and that was securing a wall, where space was limited, of great strength, with less thickness than would be necessary if it were built of brick or stone. It was a very admirable substitute where great heaps of gravel or slag were accumulated; for while such refuse was available for scarcely any other purpose, it afforded an excellent material for the formation of concrete buildings. Mr. Thompson here referred to a photograph of a large seed warehouse, which had stood the test of grain, an article that produced a greater strain upon the walls than almost any other class of goods that could be stored. He then gave details of various experiments which had been adopted to test the strength of concrete as compared with brick, the result being greatly in favour of the concrete, especially when built with brick and stone bondings. It was, therefore, very important to know that such rough materials as broken bricks and stones could be put together and run in with grouting, and produce a wall of such great strength and cheapness. In preparing foundations, he believed it was quite competent, instead of digging out the soft stuff and putting in concrete, to force down the soft substance and make it a perfectly solid mass, thus securing one of the best of foundations. In laying down concrete floors, he thought there was an advantage in covering them with water, because they set better under such a condition, and became harder and stronger than if they were allowed to dry under the influence of the ordinary air. At Cullercoats a great deal of concrete building was going on. The walls were generally formed of iron slag and sandstone, with grouting; and when dry, if struck with a hammer, they sounded like the ring of a piece of metal. The inner walls of a three-story building need not be more than 6 in. and the outer walls 9 in. thick. Concrete houses were, of course, exceedingly dry and comfortable. The inside required simply a finishing coat of plaster, and the saving in that department more than covered the cost of the outside stucco, which did not peel off the concrete as it did off stone and brick walls. Buildings, constructed with concrete walls, floors, and staircases were perfectly fireproof, the windows and door-frames being alone capable of burning.

Mr. Ebdy, Sunderland, agreed with the president that the bricklayers and stonemasons were becoming so independent in the present day that it was absolutely necessary to become independent of them as soon as possible. He believed that where stone and brick were scarce, it was necessary to fly to some such substitute as the concrete method, and it was no doubt well adapted for the construction of workmen's houses or ordinary dwellings. They had not seen it used in superior buildings, however, and up to the present time they had had little experience of its durability. They knew it made a solid body, but the question was—would it last? Would the thin frail walls that were being put up endure, and be found as solid ten years hence as now? The effects of contraction and expansion in some property put up three years ago had been such as to rip up the building as though there had been a pit working beneath it. In all concrete floors provision had to be made for expansion and contraction, and it would no doubt be found that the same effects took place in concrete buildings.

Mr. Shotton, Sunderland, gave an instance of a floor 41 ft. by 56 ft. where no such defect existed as either the expansion or the contraction of the material.

Mr. Oliver was doubtful as to the durability of the material. The question was, would atmospheric influence not affect it, as was the case with Portland stone. Another objection was, that in concrete buildings they would never be able to produce anything like architectural or æsthetic effect. Instead of brick and stone, they had a smooth surface, and would have to resort to stucco and painting.

LONDON LOCAL GOVERNMENT.

The Metropolitan Board of Works have just issued a series of returns furnished by the vestries and district Boards to the central Board, of the works and improvements effected by them since the passing of the Metropolis Local Management Act, 1855. The returns have been prepared in accordance with the request of the Home Secretary, who expressed a wish that the Metropolitan Board should assist the Government by presenting to them the result of their experience with regard to the local government of the metropolis since the Act of 1855 came into operation, with a view to enable them to consider how the present system has worked, and what improvements appear to be called for. It therefore occurred to the Metropolitan Board that it would be useful to show what the Board and the various vestries and district Boards have effected in the way of sanitary and street improvements during the period of their existence, up to the year 1870, and by this means rebut the allegations that have been freely made as to want of energy on the part of the local authorities, and indifference to the interests entrusted to them. For this purpose the following list of questions was sent to each local Board:—What extent of sewerage work have you executed since January 1st, 1856, and what has been the cost? What was the condition of the drainage of the district in 1856, and what is it now? What other sanitary improvements have you carried out since 1856, and at what cost? What quantity of paving have you executed since the same date, and what has been the cost? What amount have you expended in other works of improvement since the same date? Total amount expended in sewerage, paving, and other improvements since January 1st, 1856? Of this amount, what has been paid out of the rates, what by means of loans, and of the loan what has been repaid? What was the mileage of the streets and roadways under your jurisdiction on January 1st, 1856, and what is the present mileage? What part of this increase has been occasioned by the abolition of turnpike tolls? How many miles of streets are watered in your parish or district? What is the cost per mile for water and cartage separately? What regulations existed with regard to the inspection and improvement of courts, alleys, and dwellings, and for lighting and paving in your parish or district in 1856, and what are the regulations now in force? How many additional street-lamps have been put up since 1856? What is the price charged for lighting, cleansing, and supply of all the public lamps in the parish or district? What is the sanitary and general condition of your parish or district now, as compared with its state previous to the Metropolis Local Management Act coming into operation?"

From the replies to these questions, it appears that St. Marylebone has executed 12 miles of sewers and 7½ miles of drains since 1856, at a cost of 59,397*l.*; and that, whereas in 1856 the sewers were, in many cases, dilapidated and dangerous, and in several cases above the basements of the houses, they are now clean and well ventilated, and many have been repaired or reconstructed. A great number of sanitary improvements have also been effected, and paving to the amount of 343,726*l.* executed. The total amount expended in sewerage, paving, and other improvements, since January 1st, 1856, was 408,230*l.*, of which 342,430*l.* were paid out of the rates, and 65,800*l.* by loans, of which 3,681*l.* have been repaid. The regulations for inspection and improvement of courts, alleys, and dwellings, and for lighting and paving, were, in 1856, carried out under the management of vestry committees; but since then there is a sanitary committee for the inspection of such work, aided by a large official staff. The result is great improvement in the health of the inhabitants. No house is without water-supply. The quality of water and gas is greatly improved.

St. Pancras has executed 15·8 miles of sewers since 1856, and the condition of the drainage in the district was generally good; it has since improved. Among other sanitary improvements, public baths and wash-houses have been erected at a cost of 23,000*l.*; and 122,000 square yards of new paving have been laid down. The total amount expended in sewerage, paving, and other improvements has been 884,774*l.*, of which 791,271*l.* have been paid out of rates, and 93,503*l.* by loans, of which 40,450*l.* have been repaid. In 1856 there were in many parts no regulations with regard to the inspection and improvement of courts and dwellings, whereas now there is a rigorous supervision: disinfection is enforced, and the Nuisances Removal Acts carried out. The local authorities of St. Pancras therefore report that the sanitary condition is improved, and the rate of mortality is below the average; but pauperism has increased.

In Lambeth 53 miles of sewers have been executed since 1856, so that the condition of the drainage, from being very shallow and inefficient, is now quite effective. 560,000 yards of paving have been executed, and the total amount expended in sewerage, paving, and other improvements has been 703,505*l.*, of which 568,505*l.* have been paid out of the rates, and 135,000*l.* by means of loans, of which 55,935*l.* have been repaid. Under the system of local government the sanitary and general condition of the district has greatly improved.

In St. George's, Hanover-square, 21,427*l.* worth of sewerage works has been executed, a sanitary staff appointed, workshops, &c., inspected, impure water prohibited, many cesspools abolished, and 189,000*l.* worth of paving executed. The total amount expended in sewerage, paving, and other improvements since 1856 has been 475,238*l.*, of which 462,637*l.* have been paid out of the rates. The local authorities report that the sanitary condition has been much improved; the death-rate is 16·8 per 1,000; and water and gas are subjected to a monthly test.

In Islington 9·3 miles of sewerage works have been executed at the public expense, and 32·3 at private expense; the drainage has been much improved generally,; and 2,767,611 square feet of paving have been laid down. The total amount expended in sewerage, paving, and other improvements has been 143,384*l.*, of which 95,096*l.* have been paid out of the rates, and 34,350*l.* by means of loans, of which 3,500*l.* have been repaid. Whereas there were no known regulations for the inspection and improvement of the poorer parts of the district in 1856, the whole department is now conducted by four sanitary inspectors and a medical officer; and the general condition of the parish is reported to be much improved.

In Shoreditch 39,466 ft. of sewerage works, 146,767 ft. new granite cubes, 294,621 ft. new foot-paving, and 64,100 ft. kerb have been executed; and the drainage, which in 1856 was in

many parts very defective, is now nearly perfect, and cesspools are abolished. The total amount expended in sewerage, paving, and other improvements has been 140,000*l.*, of which 42,000*l.* have been paid out of the rates, and 98,000*l.* by means of loans, of which 23,000*l.* have been repaid. Under the old *régime*, six separate rates were levied by three different authorities, but virtually no provision was made for the inspection and improvement of courts and alleys; whereas now the various Sanitary Acts are enforced by a full staff of officers, and the condition of the district has immensely improved.

In Paddington, the total amount expended in sewerage, paving, and other improvements has been 104,257*l.*, of which 64,990*l.* have been paid out of the rates. There is systematic inspection; cleansing and drainage are enforced. The result has been that disease is greatly diminished; there are no fever dens; and great sanitary improvements have been effected.

In Bethnal Green, thirteen miles and a half of sewerage works have been constructed, and 309,000 yards of paving executed; and whereas in 1856 the greater part of the parish was almost without drainage, almost all the houses are now drained and improved. The total amount expended in sewerage, paving, and other improvements, is 95,324*l.*, of which 25,324*l.* have been paid out of the rates, and 70,000*l.* by means of loans, of which 18,700*l.* have been repaid. The district has very much improved generally; and there is a growing appreciation of the value of sanitary measures.

In Newington, the total amount expended in sewerage, paving, and other improvements (including precepts of Metropolitan Board), has been 399,624*l.*, of which 385,124*l.* have been paid out of the rates, and 14,500*l.* by means of loans, of which 3,875*l.* have been repaid. The district has been much improved; sickness has diminished; and there is a greater appreciation of sanitary knowledge.

In Camberwell, the total amount expended on sewerage, paving, and other improvements, has been 507,355*l.*, of which 427,355*l.* have been paid out of the rates, and 80,000*l.* by means of loans, of which 11,000*l.* have been repaid. In 1856, the district was almost wholly undrained, except into open sewers; but now the sewerage is complete as far as required. Formerly there was a large proportion of cesspools; they are now nearly all abolished; and the water supply is greatly improved; disinfecting apparatus and mortuary instituted; vigilant inspection from house to house by four officers; and special regulations for lodging-houses.

In St. James's, Westminster, the total cost of the sewerage, paving, and other improvements, has been 110,218*l.*, of which 104,000*l.* have been paid out of the rates, and 6,000*l.* by means of loans, of which 2,700*l.* have been repaid.

In Clerkenwell, the total amount expended in sewerage, paving, and other improvements, has been 80,740*l.*, of which 51,739*l.* 17*s.* have been paid out of the rates, and 29,000*l.* by means of loans, of which 8,583*l.* have been repaid. The sanitary condition of the district has very greatly improved, although the inhabitants are more crowded than formerly.

In Chelsea, the total amount expended in sewerage, paving, and other improvements, has been 95,406*l.*, of which 89,101*l.* have been paid out of the rates. The sanitary and general condition of the district is highly satisfactory as compared with its state before coming under the operation of the Metropolis Local Management Act.

In Kensington, the total amount expended in sewerage, paving, and other improvements, has been 206,469*l.*, of which 140,075*l.* have been paid out of the rates, and 16,464*l.* by means of loans, of which 1,000*l.* have been repaid. The condition of the parish has altogether changed since 1856; many acres of fields are now built upon,—nevertheless the sanitary and general condition of the parish is very satisfactory.

In St. Luke's, the total amount expended in sewerage, paving, and other improvements, has been 71,625*l.*, of which 49,825*l.* have been paid out of the rates, and 21,800*l.* by means of loans, of which 790*l.* have been repaid. The sanitary condition has been greatly improved since 1856, and is now very good.

In St. George's, Southwark, the total amount expended in sewerage, paving, and other improvements, has been 145,305*l.*, of which 125,305*l.* have been paid out of the rates, and 20,000*l.* by means of loans, 3,000*l.* of this last having since been repaid. The result is that the sanitary condition of the district has been greatly improved, especially in the worst localities.

In Bermondsey, the total amount expended on works has been 91,968*l.*, of which 74,219*l.* have been paid out of the rates, and 27,749*l.* by means of loans, 4,570*l.* of which have been repaid. In 1856 a considerable portion of the parish drained into open sewers and ditches; but the entire district now drains into the low-level sewer. The sanitary and general condition of the district is described as most satisfactory.

In St. George's-in-the-East, the total amount expended in sewerage, paving, and other improvements, has been 50,820*l.*, all of which has been met by the rates. In this district it is reported that the crowding is not abated; the ventilation of dwellings is imperfect, and pauperism has increased. But there is now a daily supply of good water, and the paving and scavenging have been much improved.

In St. Martin's-in-the Fields, the total amount expended in sewerage, paving, and other improvements, has been 6,654*l.*, which have been paid out of the rates; and the result of the sanitary improvements is that there is greater cleanliness, and the death-rate has decreased.

In Mile-end Old Town, the total amount expended in sewerage, paving, and other improvements has been 68,624*l.*, and cesspools and old and defective sewers have been abolished, while as regards the sanitary and general condition of the hamlet, there has been a great improvement.

In Woolwich, 22,637*l.* have been expended on sewerage, paving, and other improvements, 14,137*l.* of which were paid out of the rates, and 8,500*l.* by means of loans, of which 1,974*l.* have been repaid. The local authorities state that the sanitary and general condition of the district has been much improved, and that sanitary regulations are better appreciated by the poorer classes.

In Rotherhithe, the total amount expended in works has been 46,660*l.*, of which 29,198*l.* have been paid out of the rates, and 17,462*l.* by means of loans, of which 4,146*l.* have been repaid. There were 15 miles of open sewers; these have been abolished, and the drainage greatly improved. Nuisances are suppressed, and slaughter-houses, &c., inspected; and there is a good water supply. The rate of mortality has been diminished, and the health of the population improved.

In Hampstead, 57,572*l.* have been expended in works, of which 16,472*l.* have been paid out of the rates, and 41,100*l.* by means of loans, 11,396*l.* of which have been repaid. Besides this, 70,589*l.* have been expended in sewerage, and paving works by private individuals, under direction of the local authorities. It is difficult to compare the rural parish of 1856 with the suburban parish of the present day; but there can be no doubt that great sanitary and general improvements have been effected.

In Whitechapel, the total amount expended in sewerage, paving, and other improvements has been 88,942*l.*, of which 60,942*l.* were paid out of the rates, and 28,000*l.* by means of loans, of which 10,367*l.* have been repaid. The district has much changed for the better; offensive business and other nuisances abolished; dust-bins emptied daily, where required; and the water supply greatly improved.

In Westminster, the total amount expended in works was 119,807*l.*, the whole of which has been paid out of the rates. There is a careful supervision of slaughter-houses, &c., and a vigilant sanitary inspection; the result being that the district has greatly improved.

In Greenwich, 292,452*l.* have been expended in sewerage, paving, and other improvements. Scarcely one-fifth of the district was drained in 1856, whereas more than four-fifths are now. The result of sanitary improvements is seen in the reduction of the rate of mortality, and the decreased virulence of epidemics.

In Wandsworth, 906,609*l.* have been expended in works, 613,297*l.* of which have been paid out of the rates, and 228,000*l.* by means of loans, of which 26,492*l.* have been repaid. In 1856 this district was almost entirely unsewered, and was full of open ditches and cesspools; but 142 miles of sewers have been constructed, and the whole district is thoroughly drained into the main sewers. The sanitary and general condition of the district is described as good, and the public health much improved.

In Hackney, the expenditure on works has been 52,026*l.*, of which 12,026*l.* have been paid out of the rates, and 40,000*l.* by means of loans, of which 1,159*l.* have been repaid. In this district the sanitary and general condition has been very much improved; 33,920 nuisances abated since 1856, and the drainage and ventilation attended to.

In St. Giles's, 108,305*l.* have been expended in sewerage, paving, and other improvements, all of which has been paid out of the rates. Under an efficient staff the district is in a much better sanitary condition, and there is a constant suppression of nuisances.

In Holborn, the total amount expended on sewerage, paving, and other improvements, has been 53,146*l.*, of which 47,146*l.* were paid out of the rates, and 6,000*l.* by means of loans, 4,000*l.* of which have been repaid. There is a marked improvement in the district as regards its sanitary and general condition, although it is in a state of transition, owing to the great disturbance caused by recent alterations.

In the Strand district, 76,728*l.* have been expended on works of sewerage, paving, and improvements, 64,728*l.* of which have been paid out of the rates. The sanitary and general condition of the district has materially improved.

In the Fulham district, the total amount expended in sewerage, paving, and other improvements has been 78,572*l.*, all of which has been paid by means of loans, of which 19,818*l.* have been repaid. In 1856 the sewerage system was very bad; it is now tolerably complete, and the district greatly improved in its sanitary and general condition.

In Limehouse district, the sum of 179,945*l.* has been expended, of which 142,145*l.* have been paid out of the rates, and 37,800*l.* by means of loans, of which 12,417*l.* have been repaid. The sanitary and general condition of this district has been greatly improved.

In the Poplar district, 136,443*l.* have been expended in sewerage, paving, and other improvements, 89,127*l.* of which have been paid out of the rates, and 47,316*l.* by means of loans, of which 8,792*l.* have been repaid. Very full and strict sanitary provisions are put in force in this district, and to meet special exigencies there is an inspector of factories.

In St. Saviour's, Southwark, the total amount expended on works has been 57,850*l.*, of which 50,350*l.* have been paid out of the rates, and 7,500*l.* by means of loans, 6,700*l.* of which have been repaid. The sanitary and general condition of this district has in many respects been materially improved.

In the Plumstead district the total amount expended on works has been 106,379*l.*, of which 39,329*l.* have been paid out of the rates, and 67,050*l.* by means of loans, 10,497*l.* of which have been repaid. The local authorities report the district to have been always healthy; but it is now greatly improved, for whereas in 1856 there was no drainage beyond that afforded by open ditches and cesspools, there is now a proper sewerage system, the water supply is improved, and various nuisances have been abated.

In the Lewisham district the total amount expended in sewerage, paving, and other improvements, has been 49,796*l.*, of which 10,027*l.* have been paid out of the rates, and 39,769*l.* by means of loans, of which 14,558*l.* have been repaid. This district was also formerly undrained, but is now properly sewered, and the sanitary improvements cause it to be healthy.

In the St. Olave's, Southwark, district, 54,316*l.* have been expended in sewerage, paving, and other improvements, 50,616*l.* having been paid out of the rates, and 3,700*l.* by means of loans, of which 1,600*l.* have been repaid. Cesspools have been abolished, drainage system perfected, water supply improved, and there is strict sanitary supervision. The local authorities report that the sanitary and general condition of the district has in every sense infinitely improved.

It thus appears that the vestries and district Boards of Works of the metropolis, have executed since the period of their constitution under the Metropolis Local Management Act, 1856, works of sewerage, paving, and other improvements in their respective districts to the amount of 7,212,319*l.*

The "Father of Steam Ploughing."—Mr. J. A. Williams, of Baydon, farmer, known as "the father of steam cultivation," has been presented with a purse of 200 sovereigns and a valuable gold watch, in recognition of the services he has rendered to the cause of agricultnre, and the sacrifices made by him in working out the principle of cultivating the soil by the aid of steam. The testimonial was subscribed for by a large number of agriculturists in Berks, Wilts, and elsewhere.

PROGRESS IN THE '72 EXHIBITION.

RETROSPECT.

It seems an easy thing to *define* a word, and there are not a few who think they can do it readily and obviously; but it is in reality a most difficult thing to accomplish, and requires for each individual word a fund of knowledge, and not a little patience. Sometimes it is impossible to do it at all with any accuracy and comprehensiveness; and sometimes, what is more difficult still, it takes no little time and skill to convince those who fancy they understand some common word in its true significance, that they interpret the said word wrongly, and that things will grow clearer if but they amend their wrong interpretation, and look out for a true one. Is not this the present state of the common word *progress?* "Progress" is now in every man's mouth. We are all "progressing," and everything almost about us, from children's toys to palatial mansions, is also progressing in a way, and at a pace never before known. But what is *progress?* Lord Bacon defined progress to mean *advancement, motion forward,* and this is perhaps the general sense in which it is understood; but Shakspeare's definition, he not being quite so great a man of business as the philosophic Chancellor, was *course, procession, passage;* while Locke, it may just be noted by the curious, limited the definition to *intellectual improvement, proficiency in knowledge.* It will be seen, therefore, that this one simple and common word admits of a great variety of interpretations, and is applicable to very many different states of things. In the remarks we propose to offer on the '72 Exhibition, now about to close, it will be seen how usefully this changeable word may be brought to bear on some things in it.

We would impress this on the reader from the fact that each successive Exhibition is said to be a "progress" beyond that of its predecessor, and that each year in the civilised world of Europe is a progress beyond that of the last; and it becomes therefore not a little important to know what *progress* is, and whether it be indeed a reality. This present year's '72 Exhibition at South Kensington is, of course, a progress beyond the last, the '71 Exhibition; that is, as is supposed, the things exhibited in it are a progression beyond those exhibited in the last year's show. The world is a year older, and therefore a year wiser, and more capable, and, shall we say it? a year "cheaper," for surely "cheapness" is a part of progress. But is it indeed so? and, if so, in what way? and shall we take Bacon or Shakspeare as our dictionary, to help us to come to a conclusion about it?

In the first place, there is one thing that has *not* "progressed," at least in one sense,—the *number* of new machines for the superseding of human labour is not so great as in last year's show. There are some quite as ingenious truly, but they are fewer in number. There is the "Walter Printing Press," and, by the bye, we should like to see the name of the clever inventor and contriver of this wonderful machine in partnership with that of its far-seeing promoter and proprietor. It does all a machine can well do, as far as things have yet gone; it does all but *write*, and that with a speed truly marvellous. A great rag-washing machine, too, is quite a marvel in its way. There is also, among many others, an *envelope*-making engine, a peculiarly modern affair; for time was, but a few years ago, when the envelope was not known, but here is a machine which does all but "direct" the said envelopes. Machinery in these days is most surely triumphant. Thus we may fairly say that, in Lord Bacon's sense, machinery is "progressing" in every sense: increasing in quantity, going forward, and riding down all things. The great lawyer would surely have been himself satisfied with this progress had he lived to our day. So far, therefore, there is progress. But what will seem to so many to be the triumph of this, as of other "Exhibitions,"—as it will be doubtless of the great Vienna show of next year, with its Machinery Court a measured mile in length,—has still its melancholy and solemn side; for no man can, with any of the feelings and aspirations of the artist in him, fail to see that this so fairly boasted "progress" and power of the dead machine is gradually, but most surely, driving all handwork, or, in other words, *artist-work*, out of the world altogether. It is a curious but most significant circumstance that nearly all the few specimens of handwork to be found in the building every here and there, would seem to have been put away into corners, and to be waiting for "progress and improvement" to come to their aid, and to fit them fairly with their manufactured and machine-made competitors. We do not think that this was done intentionally: it was evidently the result of the instinct of the place and time. It is in the very nature of things as they are now going on and progressing to cast everything into the *machine*,—the *man* having nothing to do but to look at the machine as it does its work, to feed it with fuel, and to oil the joints of it. We say that this is the very genius of the time, and the way in which the "form and pressure" of it is manifested. But where is the artistic faculty all this time, and where is it allowed to show itself? This is the question!

In this Exhibition, as in the last, the French Court, as was to have been expected, is not a little conspicuous for what it exhibits. There is truly a neatness, and finish, and inventive faculty shown in French work which can hardly be found anywhere else. It seems wonderful, however, that there was not in this year's show, it was so in the last, any example of work which can be called in strict language *modern* French. It is copied, or in some way or other *borrowed* work,—borrowed, too, from all sorts of things, and from all sorts of places and times. There are *mechanical* copies of objects from *Eastern* art, which the French in Algiers seem to take to, after a fashion, and we see in this show "Cufic" inscriptions to a large scale in metal admirably executed; but who can read Cufic characters? What does the inscription mean? It is probably a text from the Koran, and means something certainly to those who first wrote it on its proper object,—as a Mosque lamp; but what is it, and what does it convey to the common Frenchman, or to the Englishman, in this new show? Why, the French workman, with all his ingenuity and skill, might do not a little for the world of art if he would but, instead of copying Cufic, go to work and mould into some sculpturesque shape, the common Roman letters, with which he prints all his books, or writes his letters. This would indeed do something, and spread his fame far and wide, for it is surely a desideratum to be able to write over even a shop-door a name and a trade, even as the Chinese do, in an *artistic* way, and worth the looking at.

Again, all cannot but have noticed that there was nothing in this year's French show which could for a moment compare, as an artistic production, with the magnificent carved *chimney-piece* of last year, wherein the sculptured drapery in white marble, so light and full of folds, and so truthful to our minds, eclipsed everything of the sort in the building. In vain we asked the name of the artist, the working artist; it ought yet to be on record, for it showed in a way not a little consoling what strength there is yet in the artist power of Europe and modernism.

We need not go into detail, for this has been done in many ways already, and our object is not so much to criticise the objects exhibited as to point out results, and to indicate a something, if possible, in the future. No one can have gone through this French part of the Exhibition without a feeling of regret that the idea of "art-manufacture" should dominate the French art, as it does the English, and for this very simple reason, that it fairly strands the Frenchman, and leaves him high and dry, and takes from him the use of his real art-power. He might as well be without it: it is a glorious faculty thrown away; and to show this, it is but necessary to look at and to examine, with some little care, the examples of hand-work exhibited in the French Court. We would specially instance the goodly show of painted dinner-plates, and other objects of the like sort. Some of these painted plates are admirably done, and it seems to be a pity indeed that the subjects on them were not a little better chosen, and from actual French life,—both town and country life. We were glad to see that our hope of last year has, to a certain extent, but not enough by a long way, been fulfilled; for a number,—a certain number,—of the objects have had the *name* of the *executive artist* written or attached to them. In one case, in a somewhat unlucky way; for the *lady* artist who painted some of these things so cleverly posted up her name in such a very conspicuous and staring way that all the world could not but suppose, as we did, that it was the name and advertisement of the exhibiting firm. This was a pity; for the lady's name ought to be known, not as mere exhibitor, but as *artist*. We have thus dwelt on the French part of the show, not because we have missed sight of the rest of it, but from the hope that the French artists will come to see what it is they are made of, how much they can do, and what a world of fame and wealth there is in that power which they possess, if they but use it aright, and throw not away the great and precious gift which is theirs by birthright, and which cannot be taken from them by conquest, but can only be lost in the process of art-manufacture! wherein the observer cannot tell one man's work from his fellow's, and where all alike, the dull and the gifted, are as one man, or one machine,—all doing the work, but no one man's hand being visible in it. Let the reader ponder on this, and carefully compare the ideas of progress in the mind of the "play-writer" and in that of the lawyer with each other. There will be found more in it than he at first sight thinks for, and the deeper he looks into it the more he will find. Some things there are which do not need "to progress": they are good and perfect as they are: they need but to be *added* to, and for the world to find more of them, it may be. Stars, and flowers, and blue sky, and cloud-forms, and mountain-tops, and a thousand other things, do not progress, except still to live, day by day, and age after age,—a "procession of marvels! So of artistic work,—the Madonnas of Raffaelle, the heads of Michelangelo, and Titian's picture-colours: *they* could hardly progress; but they live, and the world's work, its true artist-work, is to *add* to them,—each artist, mind and hand, as it has been given him to do it, individually.

We have exceeded our limits already, and could have wished to say something a little in detail on the English side of the great show. There is one special thing which ought not to be passed by in this record. It is English,—that is certain,—and fashionable, and big enough, in all conscience, and illustrates what "progress" really, in these modern days, does indeed mean. It is mechanical, too. We mean the ponderous *gun* of the latest scientific make and power, and with the *shot* or bolt by its side, beyond the power even of gunpowder to move, one would almost have thought. It did show and illustrate truly and vividly what "progress" is,—what the word means, and what it is to progress with an idea. Not only was the actual metal here shown in ponderous section; but close to it, and fixed to the wall, was the section, full size, of the biggest gun which, it seems, could well be imagined,—not in metal, be it observed, but in wood, painted iron-colour. Now, here was, indeed, "progress," in a sense in which neither Bacon nor poor Shakspeare, with all his imagination, could well have dreamed of. "Progress," from the possible and the actual, all on the move, and going on day by day, before the astonished world's eye, but progress even far beyond this, into the regions of the *impossible*. But we do not like to be beaten even here. Why was not a piece of armour-plate shown so thick, and so big, and so tough, and so impassible, as to defy even the gigantic imaginative war-tool! Such is modern progress!

PROGRESS OF CARDIFF.

The onward expansion of the commercial and maritime emporium on the coast of South Wales bids fair, at no remote date, to be a formidable competitor with the great port on the south-western shore of Lancashire. At least, within the last half-century, Liverpool has been the main maritime outlet between this country and the Atlantic. The Thames has, indeed, contributed to a certain extent to this end, but the shores of the Mersey have for some years been the chief scene of Anglo-American intercourse. Indeed, from the establishment of the Cunard line of mail steamships, now some thirty years ago, down to the present time, when no less than six distinct American fleets can be numbered as trading between Liverpool and New York, the port of Liverpool, practically having no rival, has been in undisturbed possession of the American passenger and merchandise trade.

This unruffled monopoly is about to be invaded. Cardiff,—commercial and marine,—has for some years been making rapid strides, and she now appears to have attained a position which justifies her in bidding for a share of the trade between this country and America, and to-day practically illustrates the venture. A body called the West Atlantic Steamship Company are about to place on the station between Cardiff and New York, a fleet of steamers for passenger traffic similar to those which now sail between Liverpool and New York. The pioneer of this line of steamers sails

to-day for the West from the enterprising Welsh port. The vessel, which has appropriately been named the *Glamorgan*, is a large ship of 2,500 tons register, with a carrying capacity of 4,000 tons, and having compound engines of 450-horse power nominal, but which will work up to 1,800-horse power. The *Glamorgan*, in addition to the usual fittings and decorations, is supplied with one of Allen's gas-making apparatus, capable of supplying from 100 to 300 burners; and the large capacity of the *Glamorgan* will necessitate the adoption of the larger number. The intention of the promoters is to place a full complement of ships upon the line, and a sister ship to the *Glamorgan*, to be called the *Pembroke*, is now in course of construction on the Clyde. In connexion with this enterprise, it may be stated, that the Great Western Railway Company, in anticipation of an increased source of traffic, are about to expend 40,000*l.* in the erection of a new station at Cardiff, and a new floating harbour is also in contemplation at the neighbouring district of Neath.

THE HOUSES AND POPULATION IN ST. GEORGE'S-IN-THE-EAST.

The annual report of the St. George's-in-the-East Vestry, which has just been issued, contains some interesting statistics as to the number of houses and the population in the area within the district. It appears that both as regards houses and inhabitants the census returns of 1871 show a decrease as compared with the returns of 1861. The number of occupied houses is less by 262 than in 1861, whilst there is a falling off in the population to the extent of 656. This decrease is in some measure accounted for by a considerable number of houses having been taken down to make way for the works of the East London Railway, and also by the guardians having demolished a number of tenements for the purpose of erecting the new workhouse infirmary on the site. Notwithstanding, however, that there is this numerical falling off in both houses and population, the latter is relatively more dense than it was in 1861, as at that period 48,891 persons were residing in 6,186 houses, being at the rate of 7·9 persons in each house; whereas, according to the late returns 48,239 persons are living in 5,924 houses, or 8 persons in each house. The Vestry contemplate the widening of Wapping, which they think is desirable in consequence of the erection of the new station of the Great Eastern Railway Company in Leman-street, shortly to be opened, but they consider that it ought to be carried out as a metropolitan rather than a local improvement, and they have resolved to apply to the Metropolitan Board of Works on the subject.

FROM OXFORD.

The Restoration of Christ Church Cathedral.—The restoration of this cathedral is still being proceeded with. The nave is being lengthened 20 ft. at the west end, and the new entrance to the edifice from the "Tom Quad," will shortly be completed. The cathedral has been reseated throughout with Italian walnut-wood seats, richly carved. A new altar-table of cedar wood, with carved caps and bases, and four ivory crosses on the surface of the table, has been placed in the chancel. The total cost of the restoration will be upwards of 21,000*l.*, towards which 100*l.* have been given by the Queen, in her capacity as visitor, a like amount by the Prince of Wales; 1,000*l.* have been given from the corporation fund of Christ Church; a like amount from the chapter fund; 2,625*l.* by individual members of the governing body of Christ Church; and 6,925*l.* by its present and former members.

Restoration of Merton College Hall, Oxford.—The hall of Merton College has undergone a complete restoration at a cost of upwards of 4,000*l.* About the year 1790 some alterations were made in the Hall by Mr. Wyatt, architect, who destroyed the then existing roof, windows, and all the architectural features of the building, and substituted for the open-timber roof one in plaster groining. He blocked up all the window-seats and openings, and concealed the walls behind the plaster partitions, thereby leaving none of the original features of the Hall open to view. In fact, those alterations were a mixture of classical and we may almost say debased Gothic work. A short time since Sir Gilbert Scott was engaged to restore the building, and the whole of the work that Mr. Wyatt executed has been cleared away. The new work is in accordance with the original construction of the Hall, which is of fourteenth-century date. The whole of the interior has been restored, and the exterior renovated, and the walls are refaced with Taynton stone.

McKEAN'S ROCK DRILL.

The production of a satisfactory rock-drill for tunnelling, mining, well-sinking, and other similar purposes is a matter of so much importance and difficulty that many minds have been employed upon it for some time past. Several such machines have been invented, and have done and are doing good work, still leaving, however, something to be desired. The last placed before the public is one of which a diagram appears in our advertising columns, McKean's Rock Drill. We went to look at it the other day, and feel bound to say that in respect of simplicity, strength in the right place, and applicability to varying situations, it seems to us to make a strong claim on the attention of those interested in such an invention. The machine we saw is of the size ordinarily used for quarry-work or open-cutting, weighing about 150 lb., with a single drill mounted on a frame. A smaller, and for many purposes a still more convenient form, is being manufactured, which can be handled by one man. With a steam-pressure of 75 lb. to the inch, it will drill, as a maximum, a 2¼-in. hole to a depth of 12 in. per minute in Aberdeen granite, but the average duty is estimated at from 6 in. to 9 in. per minute, and the number of strokes from 500 to 1,000. It is driven by steam, but compressed air would be applied for tunnel-work. We advise such of our readers as may need a rock-drill to make a journey to the Borough-road, and look into the matter for themselves.

METROPOLITAN DISTRICT SURVEYORS.

The superintending architect of the Metropolitan Board of Works, Mr. Vulliamy, has issued his report for 1871, on the monthly returns of district surveyors, giving a general abstract of the returns of fees for the year 1871, along with a list showing the comparative revenues of the several districts into which the metropolis is divided.

The total of the gross fees received for the year is 29,099*l.* 10s. 6d., in respect of 18,948 works, of which above two-thirds were done within the year. The gross fees received in thirty-seven districts vary from 60*l.* to 490*l.*, five being under 200*l.* each, six under 300*l.*, fourteen under 400*l.*, and twelve under 500*l.* In twenty-two districts the incomes vary from 508*l.* to 1,221*l.* The expenses of district offices are 7,459*l.* 3s. 7d. The fees remaining due for all arrears are 29,139*l.*, but probably mostly of little value. The sums abated or lost are 2,262*l.* 19s. 10d. Compared with the results of former years the present abstract shows still a decrease.

	Works.	Fees received.
1862	15,707	£25,315 2 3
1863	17,954	29,440 9 9
1864	18,984	31,803 5 2
1865	19,251	32,972 7 9
1866	20,196	34,989 11 4
1867	21,303	36,674 6 0
1868	21,915	37,790 13 5
1869	19,947	33,246 19 6
1870	18,899	30,003 2 4
1871	18,948	29,099 0 6

A NEW THEATRE FOR DARLINGTON.

The present building in Northgate, now used as a theatre, is to be pulled down, and a new one to be built upon its site. The new theatre will be much larger and more commodious. The street façade,—not so extensive as at first proposed,—is in the Gothic style of architecture, adapted to modern times, and the front is broken up, in making a feature of the main entrance, which is the central object, and the superstructure, by recessing the other portions of the façade. The doorway is arched, finished with a hood-mould stopped on the foliated capitals of the pilasters: the tympanum of the arch is intended to have some dramatic scene carved in either wood or stone. The second story is formed of an arcade of windows, with circular shafts and foliated capitals. The upper portion is reserved for three niches. The whole is broken up with horizontal strings, and finished with a cornice. The principal entrance is by a corridor, on the left of which is a ticket-office, so planned as to supply tickets to the pit and gallery occupants, and the occupants of the dress circle, without coming into contact with each other. The staircase to dress circle is intended to be of stone, at the top of which is a large landing, from which is the entrance to the dress circle and private boxes. The auditorium at this level is 46 ft. wide and 48 ft. deep. The stage is 47 ft. wide and 46 ft. deep, and so constructed that it may be removed if required, and be used for acrobatic and equestrian performances. Entrance to the pit is obtained through a door in the passage on the right of the main entrance, and a wide staircase leads to the gallery. Provision has been made in the shape of lavatories, &c. The ceiling is flat, with a cornice round, which is intended to be relieved with centre flowers and medallions, the latter formed for carrying off vitiated and heated air. Ventilation shafts in the walls with air-grates are let into each tier. On the top of the roof is a large louvre, which supplements the other ventilators. The lighting of the theatre will be from a fan-light. The means of egress in case of fire have been considered. Besides a broad flight of steps from the gallery, in addition to the admittance entrances, there are two other doors opening into a spacious yard, which may be thrown open on an emergency. The doors also slide. The building is calculated to hold 1,300 persons sitting. In the large yard at the back there is room for dressing-rooms, &c., and also for stabling accommodation for circuses. Mr. W. Hodgson is the architect.

SALARIES OF ENGINEERS TO MUNICIPAL BOARDS.

The following list gives the amounts of salaries paid to some of the principal engineers and surveyors to municipal bodies and local Boards of Health:—

Name of Towns.	Amount of Salaries paid.	Population, Census of 1861.
Local Government Board—		
Chief Inspector	£1,000	—
Two other Inspectors	800 each	—
Metropolitan Board—		
Chief Engineer	2,000 and private practice	—
Assistant Surveyors	1,000 each	—
Liverpool	1,300 allowed pupils	443,938
Manchester	750 applying for 1,300*l.*	357,979
Birmingham	600	296,076
Leeds	300	207,165
Sheffield	400 and private practice	185,670
Bristol	500 and 120*l.* for horse and trap	154,093
Wolverhampton	550	147,670
Newcastle-on-Tyne	600	109,108
Salford	350	102,449
Hull	250 and private practice	97,660
Oldham	300	94,344
Brighton	400	87,000
Norwich	400	74,671
Nottingham	400	74,603
Leicester	500	68,056
Birkenhead	500	51,649
Portsmouth	500	49,779
Southampton	400	46,960
Derby	330 and private practice	43,091
Exeter	300 and private practice	41,749
Cheltenham	300 and private practice	39,693
Wigan	300 and private practice	37,658
Halifax	310	37,104
Huddersfield	350 and private practice	34,877

THE ESCURIAL.

As briefly stated in the *Builder*, last week, the Escurial was struck by lightning and fired. The damage, fortunately, however, was localised. It spread by the angle of the Colegio and roof of the Library. The Seminary tower and the Lantern tower have fallen.

The damage done will cost about 40,000*l.* to repair, and this King Amadeus offers himself to defray. The Library, around and above which was the principal seat of the fire, is of world-wide renown. It contained fourteen to fifteen thousand of the rarest books and the oldest manuscripts. These were all saved, as were also the valuable paintings which hung on the walls.

The Escurial is situated about thirty miles north-west of Madrid. It was begun in 1557 by the moody monarch Philip II., whose amatory advances were so sternly refused by our own virgin Elizabeth, and was erected in commemoration of the battle of St. Quentin, which was won, by the force of Spanish arms, on the day dedicated to San Lorenzo, in the Papal calendar. Hence, its name, "El Real Sitio de San Lorenzo, el Real de Escorial."

The first architect was Juan Baptista Manegro, of Toledo, and upon his death, in 1567, the work was continued by Juan Bustamante, one of his pupils.

The building is whimsically constructed in the

form of a gridiron, on which instrument of torture the saint to whom it is dedicated is said to have been broiled alive. Everything in the Escurial is commemorative of his martyrdom. The gridiron is seen upon the doors, windows, altars, and even the rituals and sacerdotal habits display it. As to the edifice itself, the principal front faces the west, and behind it is a mountain: the opposite side looks towards Madrid, and takes the form of the shortened handle of the gridiron, while the bars are represented by the interior intersecting buildings, and the four legs are portrayed by the spires of four little square towers, which arise at the four angles. The western front shows a fine portal formed by large columns of the Doric order, half sunk in the wall, on each side of which are two huge doorways. The whole edifice is of a species of bastard granite, called berroquena, and the brownish hue which it has assumed through time adds to rather than diminishes the natural severity of its aspect. The quarry whence it was dug is close by, and its vicinity is said to have been one reason for the choice of such an inconvenient and unattractive site. The same stone is also seen in the little village of the same name, which nestles at the foot of the main building.

The central structure, around which all the vast aggregate of buildings spreads, is the magnificent temple built on the model of St. Peter's at Rome. It stands in the centre of the parallelogram which forms the gridiron, and is in the shape of a Greek cross, with a splendid dome 330 ft. high in the centre, and lofty towers at the ends. All the wealth of Spain was lavished on this church. It is 374 ft. long and 230 ft. broad; is divided into seven aisles, paved with black marble; and the walls are everywhere covered with porphyry, jasper, and marbles of infinite variety, and with statue-portraits of the kings of Spain. This church forms one side of the central court of the building. On the other side is the grand central Doric and Ionic portal which opens twice for every Spanish monarch,—first, when he is carried to his baptism; last, when he is borne to his grave, by three nobles and three monks. The *Patio de los Reyes*, where the present conflagration is said to have broken out, is so called because it is surrounded by six statues, 17 ft. high, of the kings of Judah, who were connected with the Temple of Jerusalem. They were all cut, it is said, from one solid block, and enough still remains of it to complete the dozen. The church itself contains forty chapels, each with its altar. The ceiling is covered with the frescoes of Giordano, forming a pictorial history of Christianity; and of the forty-two pictures which adorn the sacristy, each one is said to be a masterpiece. The church is described by Ford as,—

"The triumph of architecture. It takes away the breath of the beholder, from its majestic simplicity. All is quiet, solemn, unadorned. No tinsel statues or tawdry gildings mar the perfect proportion of the chaste Christian temple. The religious sentiment pervades the whole of this House of God: everything mean or trivial is forgotten."

The royal tomb is under the high altar, in order that when the priest raises the Host he may do so exactly above the dead. Descending by a flight of polished marble steps, between walls of yellow jasper, we come on an octagonal chamber, 36 ft. wide and 38 ft. high. In the eight black marble sides are six-and-twenty niches, with a black marble sarcophagus in each. Of these sarcophagi sixteen are full, and the rest await their occupants. None but reigning monarchs are buried here, the monarch to the right of the altar and the consort to the left. Had Queen Isabella remained on the throne she would have been laid, at her death, under her father, and her husband would have been placed among the queens on the other side. Other royal personages are buried in a chapel called the Pantheon of the Infantas.

The great library is above the front of the hall called the Patio de los Reyes. It is an arched room, 194 ft. long by some 32 ft. wide and 36 ft. high. The books had their edges, not their backs, shown on the shelves. They were originally arranged so, and the arrangement was never altered till now.

According to some accounts the length of all the rooms and apartments in the Escurial is above 120 English miles, and it contains 14,000 doors and 11,000 windows. These statements may be exaggerations. The fire broke out at half-past eleven on Tuesday night (1st inst.). Only a single effective engine was at first brought to bear upon it; those from Madrid not arriving till 6 a.m., when the conflagration was already much reduced. The people of the village made such exertions as to remove some 14,600 books within an hour.

The *Correspondencia* believes that this is the fourth time that the Escurial has been set on fire by lightning. Ford does not mention any such occasions, but notes with surprise that an English translation, bearing date 1671, of Santos's "Descripcion del Escorial," announced on its title-page that the Escurial had lately been consumed by fire. As it is, one has reason to be thankful that the great gridiron has been saved from the fire, in which, to carry out its symbolical idea, it ought to have been incombustible.

A fine painting of the Escurial, with its surroundings, by Rubens, will be remembered by visitors to the Royal Academy Exhibition of Old Masters.

THE WOLVERHAMPTON PILLAR.

I should like to see the pillar for myself; but I think the engraving in the *Builder* is quite enough to show that the column has more affinity to Roman than to Norman work, and is, as you say, *Saxon*. As for the term, "Danes' Cross," it is only interesting in showing that the column *is very old*; and that people gave the name to cover their ignorance, as they ascribe everything they deem wonderful to the Devil. The Danes left a strong impress of their savage nature upon the land; and thus with Satan they divide the glory of the unknown, the desolate, and the remarkable. The field at Hartlip in which the Roman villa stood is called "Danes' Field."

C. Roach Smith.

CASERTA MARBLES.

We have been interested by some specimens, now in Fenchurch-street, of marbles quarried in the Apennines, not far from Naples. Those quarries were opened by Vanvitelli in the last century, and were used exclusively for the royal palaces of Caserta and Naples, the noble halls and staircases of which will be remembered by many of our readers. The great cost of transport prevented these marbles coming into general use, but it seems they can now be obtained at no greater cost than ordinary fancy marbles, many of which they far surpass in beauty. The rich agathe, the large mottled jasper, the rose and grey drifts are certainly beautiful, and should be made use of.

THE LORD MAYOR AND ALEXANDRA PARK.

The newspapers announce that the skilled workmen, who are anxious that the working classes should possess the palace, with the unentailed park of 500 acres, have presented to the Lord Mayor a unique work of fine art, executed by one of their number. It will bear an inscription expressive of their appreciation of the Lord Mayor's efforts to acquire and save the estate for their benefit. Surely it would be wise of the Lord Mayor to wait till he had really done something towards effecting the object. At present, the whole scheme continues to be of the most unbusiness-like description.

We are very anxious to see the Park and Palace secured as a public recreation-place, but we are unable to persuade ourselves that this is at all likely to result from the present proposals.

MADELEY CHURCH.

The parish church at Madeley, near Newcastle-under-Lyne, which is one of the most ancient, and, from an archæological point of view, one of the most interesting ecclesiastical edifices in North Staffordshire, has been re-opened by the Bishop of Lichfield, after having undergone a renovation and having a new chancel built. The work has been done at a cost of about 5,000*l*. The new chancel has been built at the expense of Lord Crewe, who, in fact, has defrayed the entire cost of the alterations, with the exception of about 500*l*. contributed by parishioners and friends.

The chancel is about 35 ft. long by 20 ft. wide; the body of the church about 60 ft. by 50 ft., and it measures about 72 ft. across the transepts. The church affords accommodation for about 400. The works now about complete principally consist of the rebuilding of the chancel, the erection of an organ-chamber, the obliteration of many coats of whitewash from the walls, piers, and arches; the destruction of flat plaster ceilings, western gallery, and high and square pews in the church and chancel; the total renovation of the floors, glass of windows, lead roof coverings to north and south aisles; and a complete re-fitting of the interior.

The whole of the chancel has been rebuilt in fourteenth-century character. The walls are of coursed stone inside and outside. On the north side are two arches between the organ-chamber and the vestry; on the south a priests' door and windows,—one of two lights and the other of three. The east end has a five-light window, and the old chancel arch remains at the west end. The roof is entirely of oak, and has six bays with arched ribs, moulded timbers, open rafters, and plain boarded ceiling between rafters. The floor to stalls is of wood, all the other part being of tiles. There are five steps of stone from nave to altar. The eastern bay of the roof is decorated in gold and colour; the other bays are of simpler character, the oak in all cases forming the groundwork for decoration. The tiles of the floor are of varied patterns, mostly enriched by indented outlines, and some encaustic taken from old tiles found in the church during the restoration. The stained glass is by Messrs. Clayton & Bell. The east window represents in the main lights the following events in the life of our Lord: in the centre, the crucifixion; to the north, the bearing of the cross, the agony in the garden; to the south, the entombment and the resurrection. The tracery above contains emblems of the four Evangelists. The eastern window in the south wall has the adoration of the Magi; the western, the Last Supper. The sanctuary is fitted with sedilia, credence, altar of oak, reredos, altar-rail, bishop's chair, and two seven-light standards. The super-altar is of polished Derbyshire marble. The centre of the reredos has a red marble back, and on it a white statuary marble cross under an arched recess, the spandrels of which bear the monograms Alpha and Omega. The two side compartments contain medallions with inlaid *fleur-de-lis*. The principal members are of alabaster found in the church, the plainer surfaces being of Hoptawood stone. The arch mouldings, cornice, and impost are carved with the vine, wheat, and lily. On the north and south sides of the chancel are stalls for the clergy and choir, all of oak, slightly carved on the ends and fronts. There are standards for lighting at each end of the stalls. The present organ is a temporary one, a strike in the organ-building trade having delayed the erection of the permanent organ.

In the body of the church the ancient stone-work in the walls, piers, arches, and window dressings has been completely restored, the clearstory windows being entirely new. The variety of tint in the natural stone, the difference of workmanship of the several styles, and the multifarious plan give interest to the simple architecture of the interior. The timbers of the nave roof, as put in about 100 years ago, although very simple, are of oak and of large dimensions. They have been thrown open to view, and slightly decorated in colour. The roof timbers of the south aisle remain unaltered beyond necessary repairs. Those to the north aisle are old, but have been raised from a flat to a slight pitch. The trusses in the transepts have been thrown open and the rafters boarded beneath; the whole slightly decorated in colour. The windows generally are glazed with cathedral glass, in patterns and tints of varied design, executed by Messrs. Heaton, Butler, & Bayne. One two-light window on the north side is of stained glass by Hardman; it is the gift of Mr. E. H. Martin, in memory of his father, and represents the sower of good seed and of evil seed. The three-light west window of the south aisle is also of stained glass, the gift of the Rev. J. W. Daltry, the vicar, in memory of his daughter, and is the work of Messrs. Morris & Co., representing Noah, typical of the old church; St. Peter, of the new church; St. Philip, the work of the church; and the crucifixion as its crowning act. The floors under the benches are of wood, the passages of plain tiles, varied by sundry ancient brasses, coffin-lids, and monumental slabs of stone and alabaster found in the old walls and floor. The fittings consist of brass lectern by Messrs. Hardman & Co.; oak pulpit, Litany-desk, and benches; and stone font. The pulpit is hexagonal, of early seventeenth-century work, richly treated. The panels have been decorated in gold and colour, having in them the emblems

of the four Evangelists, representations of the five wounds, instruments of the passion of our Lord, &c. The pulpit has been illuminated at the cost of the architect. The benches made a few years ago have been refixed, the remainder being designed from ancient examples found under the modern pewing. The belfry floor, formerly hidden by the organ, is now disclosed, and is thrown open to the church, whence the ringers are visible while at their work. The quaint balustrade of this loft bears date 1634. The provision for lighting is by candle standards of wrought iron. The several doors are screened by hangings. The heating is by hot water.

In the exterior of the building every ancient stone and other material that could be preserved has been left in its place. The new works are the chancel, organ-chamber, parapets to aisles, clearstory, and tower, lead on roof of aisles to the east chapel, and north porch.

The architect was Mr. Charles Lynam, of Stoke, under whose superintendence the whole of the work has been completed. The contractor for the general works was Mr. John Stringer, of Sandbach; the decorations have been done by Messrs. Heaton, Butler, & Bayne; the iron and other metal works by Messrs. Hardman & Co.; the general carving by Mr. O'Shee, of Manchester. The reredos was executed by Mr. J. C. Daniel, of Hanley.

The churchyard has been enlarged and improved by the lowering of the ground and tombstones and by the erection of new boundary walls.

THE DRINKING FOUNTAIN MOVEMENT.

The Lord Mayor of London has publicly opened a drinking-fountain at Bow, as a memorial of the successful opposition to the proposed match tax of 1871, and in honour of the firm of Bryant & May, who were mainly instrumental in averting what was considered a serious injury to many thousands of the very poorest class of workpeople in the metropolis. The site fronts the North London Railway Station. The fountain was designed by Mr. Rowland Plumbe, and executed by Mr. J. W. Seale. It has been made over to the Metropolitan Drinking Fountain Association, who have undertaken its care, and will supply it with water. It is handsome and appropriate.

At the last meeting of the Norwich town council, a letter was read from Mr. E. Freestone, offering to give half a dozen drinking-fountains to the city. The letter stated that he had seen in Scotland some very simple drinking-fountains, and feeling that they would be appreciated in Norwich in a sanitary point of view, be of great service to the working classes, and might be used for horses and other stock to drink at, he enclosed a drawing of one of them, and if the City would allow him to put up half a dozen, he would be happy to make a present of the fountains and fittings, so that the City would only have to supply the water. Mr. Freestone proposed the following places as sites for the fountains:—Stump Cross, St. Giles's (near the branch road to Bethel-street), St. Stephen's-plain, near Timberhill church, Trowse end of King-street, and Foundry-road (near the triangular plantation).—The letter was referred to the Executive Committee, Mr. Youngs remarking that to Mr. Freestone's liberality many were indebted for the comfort of the iron seats upon the Castle-hill. The thanks of the council were unanimously accorded to Mr. Freestone.

SCHOOLS OF ART AND OF SCIENCE.

The Watford School of Science and Art.—Lord Ebury distributed the prizes gained by the pupils at the Science and Art Class at Watford. After referring to the origin of the classes in the establishment of a school of design in Spitalfields, his lordship said he was told that all the pupil-teachers in the elementary schools in the town were students in the Science and Art classes. They would carry, no doubt, the knowledge they there obtained to the elementary schools, and thus the standard of education would be raised by the exertions which had been made in the successful establishment of these Schools of Art and Science.

Bradford Art Society's Exhibition.—The third annual exhibition of the Bradford Art Society has been opened in the Freemasons' Hall, in Salem-street, Manor-row, Bradford, and the collection of pictures and drawings—about 150 in number—constitute an interesting and creditable exhibition of the original productions of local artists, professional and amateur.

Proposed School of Art at Stafford.—This town has been visited by Mr. Chittenden, a Certificated Master of the Department of Science and Art in London, who has had interviews with some of the most influential inhabitants with the view of establishing a School of Art in the town. An important county town like Stafford should not have so long been without such an institution. The local *Advertiser* states that most of the gentlemen upon whom Mr. Chittenden called expressed themselves as being fully aware of the benefit that would accrue from his proposal, but doubted its success, as there was no particular branch of business in the town requiring art instruction. But this would appear to be a mistaken view of the object and effect of Schools of Art, as with few exceptions they are supported by artizans of every description—engineers, carpenters, joiners, paperhangers, decorators, &c., and by any person from twelve years of age to thirty who wishes to avail himself of the opportunity of improving the leisure time he has at his disposal. Mr. Chittenden instanced to our authority the fact that at Wolverhampton School of Art, where he was head-master for five years, the japanners, for whose benefit the school was originally intended, never attended it in any number; but that the pupils consist of every description of mechanic and tradesmen's assistants in the evening class, and the sons and daughters of the principal inhabitants in the town in the morning and afternoon. As the Committee of Council on Education now make drawing so conspicuous a feature in the curriculum of school education, it is to be hoped that Stafford will no longer be unprovided with the means of acquiring so refining and useful an attainment.

Wedgwood Institute Schools of Science and Art. The annual public meeting of the friends of the Schools of Science and Art connected with the Wedgwood Institute, Burslem, has been held in the town-hall. There was a large attendance. Sir Edward Manningham Buller, bart., M.P., presided. The report of the committee stated that there is every reason to regard the progress and prospects of the school as eminently encouraging. Mr. Theaker, the head-master, in his report, said that, while there was room for further improvement, he was enabled to say the studies had been of a steady, progressive character, as evidenced by the number of works sent up to London for examination, and the increased value of the awards.

SLATE *versus* LEAD AS A ROOF COVERING.

WORCESTER CATHEDRAL.

Sir,—In the remarks of your correspondent, "N.," on Worcester Cathedral, in the current issue of the *Builder*, he seems to take exception to the restoration of this cathedral being considered complete while the roofs remain covered with slate instead of lead, the original covering; and thinks that the "replacing of the metal covering" is being delayed simply from a lack of the necessary funds.

It is somewhat surprising to find the superiority of lead, as a roof covering, insisted upon, so soon after the recent disaster at Canterbury Cathedral has shown that its use may be attended with much danger.

Experience teaches that stone-slate or slate practically answers all the purposes of lead, as an entire covering for roofs, without many of its disadvantages; while their capacity for architectural treatment is quite equal to that of their metallic rival.

Roofs covered with these materials, need not necessarily be "*mean*" in appearance: their first cost is considerably less than that of lead, and they need but little attention and reparation afterwards.

Lead, on the contrary, is not only very costly, but is always a source of trouble and expense in reparation, and very liable to suffer from defective laying. Being fusible at a low temperature, it facilitates the action of a fire when it has once broken out in a building. Many other obvious disadvantages combine to make it an undesirable covering; and by many of our leading architects, its use is now judiciously restricted to flats, gutters, and the like, it being superseded by slate and other materials as an entire covering.

It is scarcely necessary, perhaps, to remind your correspondent, that "literal copyism" is not "intelligent restoration." Let us, therefore, hope that his suggestion will fail to impress the authorities of Worcester Cathedral, and that they will refuse to recognise in it a justification of an extravagant and unwise expenditure. J. S.

MODERN ARCHITECTURE IN GERMANY.

BOEDDEKEN MANOR HOUSE.

The Manor House of Boeddeken, about three miles from Paderborn, in Westphalia, the seat of Herr George von Mallinkrodt, was, until the commencement of this century, a convent of Canons Regular of the order of St. Augustine. The history of this religious house dates from the year 836, when it was founded by St. Meinolphus, archdeacon of Paderborn, as a convent for nuns. In 1409 it was refounded, and given to the Canons Regular. In 1803 the monastery was secularised, and a few years afterwards the ancient church was destroyed,—a work of considerable difficulty, owing to the great solidity of its construction. Nothing, however, was left of it but the base of the old Romanesque tower and the walls of the chancel, which latter date from the earlier part of the fifteenth century. The present possessor of the building, Herr George von Mallinkrodt, the brother of Prince Bismark's most talented and courageous opponent in the German Reichstag, is restoring the chancel and tower before mentioned as a domestic chapel. The drawings we reproduce, and which, we should mention, are *fac-similes*, of the architect's working drawings, represent the additions now being carried out in connexion with the partial rebuilding of one of the wings of what was originally a portion of the monastic buildings. This wing contains the drawing-room, principal staircase, and reception-rooms of the mansion; and our drawings represent especially the bow window of the drawing-room, front and side; and the folding-doors of the same apartment. The whole of the timber-work is executed in the finest oak, and the upper portions of the windows are filled with stained glass, in mosaic patterns. Considerable use will also be made of colour and gilding. This same wing also contains the grand staircase, which is now completed, and is a very noble work. The stairs are composed of solid logs of oak supported upon columns of the same material, which, being carried up to the ceiling, support the timbers of the roof. The whole is richly carved and moulded, and decorated with gilding and colour. The architect of these works is Mr. Guldenpfennig, of Paderborn, whose works have been frequently mentioned in this journal.

It will be seen from the drawings which we publish that the whole is being carried out in an elaborate style, and the designs show the originality and skill possessed by the architect. We would draw our readers' attention specially to two points in these designs which show how well a good architect can get over a difficulty. The first is the way in which the bow-window is corbelled out, and the second is the way in which the space between the folding-doors and the ceiling is filled up. It should be recollected that these folding-doors are not like our English ones, intended to be kept *open*, but are like the French doors, which are always kept *shut*, and their purpose is to provide a large and important means of ingress or egress when receptions, &c., are given, or by opening only one valve, to give sufficient room for one person to pass, when a large aperture is not requisite. We think that this kind of doorway might be advantageously introduced more often into this country than it is, as it has many advantages over the ordinary room-door in use here. The whole opening is some 5 ft. wide; but by this arrangement only 2 ft. 6 in. need be open at one time, and when the whole space is open the doors, of course, only project into the room 2 ft. 6 in.

Great use seems to have been made of quaint German and Latin inscriptions in various parts of this building: thus, over the folding-doors is the following legend:—

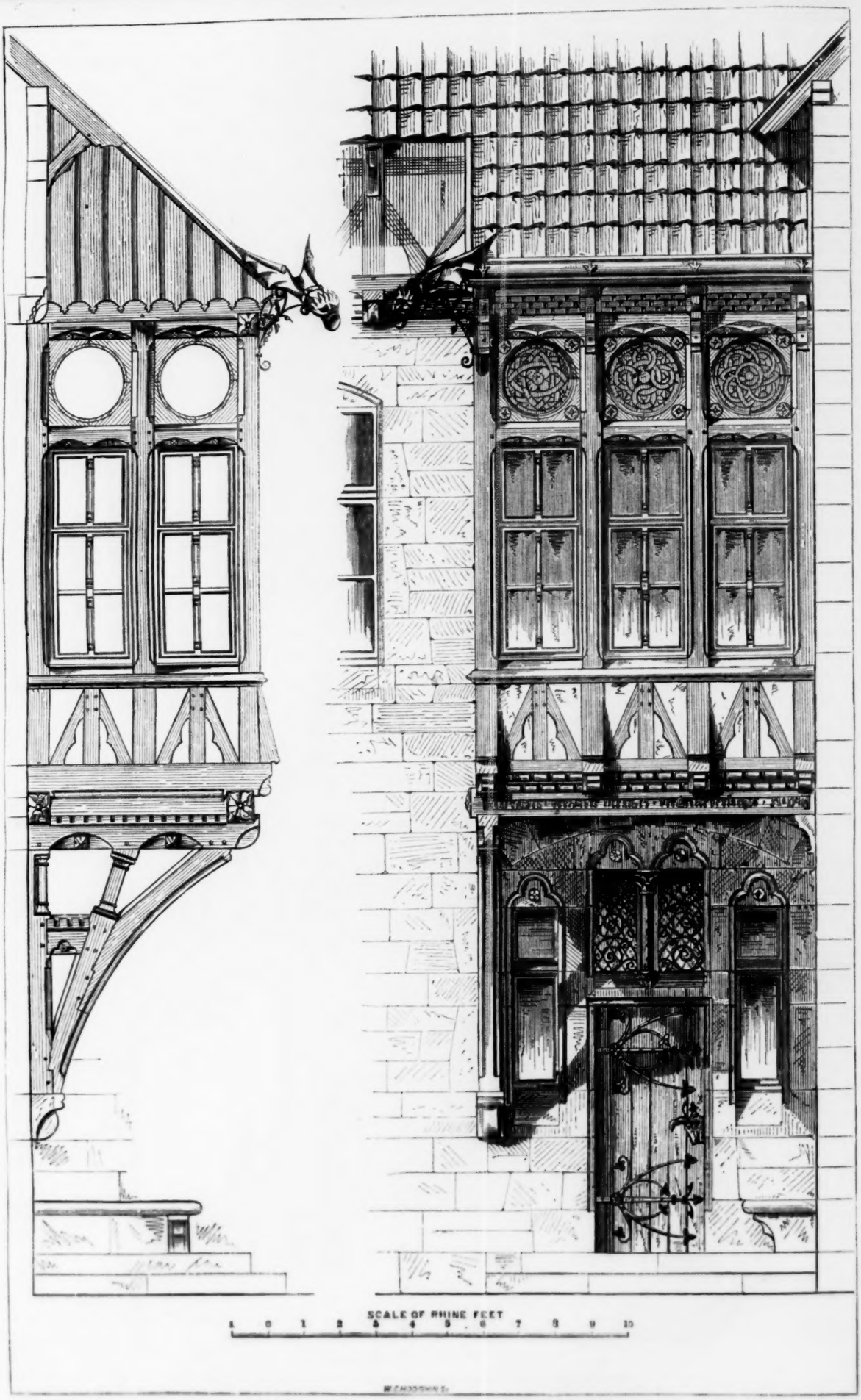
"*Herscht heut der Teufel auch auf Erden: Morgen wird Gott meister merden.* A.D. 1871."

"If the devil rules on earth to-day: God will be master to-morrow. A.D. 1871."

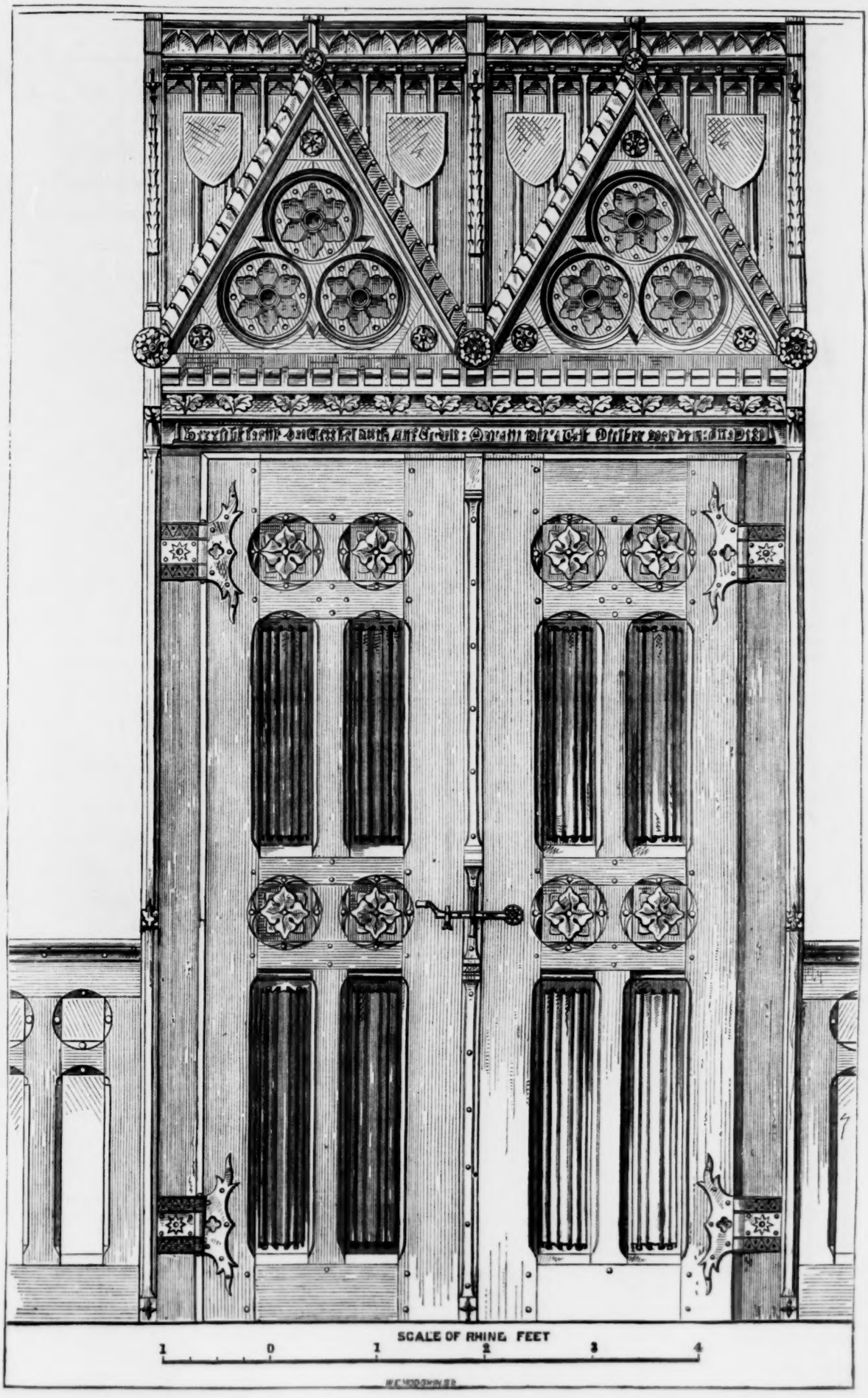
Over the chief door of the dining-room is the following inscription:—

"*Quidcumque agas prudenter ages et respice finem.*"

"Whatever you do, do it prudently, and look to the end:"—an excellent piece of advice before partaking of a German dinner, which often consists of eight or ten courses.



DOORWAY AND BOW WINDOW, BOEDDEKEN MANOR HOUSE, NEAR PADERBORN.
Herr A. Guldenpfennig, Architect.



FOLDING-DOORS, DRAWING-ROOM, BOEDDEKEN MANOR HOUSE, WESTPHALIA.

ARTIFICIAL STONE FOR HYDRAULIC WORK.

In the paper read by Mr. F. Ransome at the recent Brighton Congress, on "Some Recent Improvements in the Manufacture of Artificial Stone," the reader, after describing his new process, by means of which the field has been widely extended for the application of the stone produced, and which, for convenience, as distinguishing it from all others, has been termed "Apœnite," said,—It is now no difficult task to produce blocks of this material of any form and of any size, the only limit being the means available for handling them upon the spot where they are employed. Moreover, the materials which form the bulk of apœnite are, as a rule, generally to be found in abundance where hydraulic or other important works are being carried on, and for which purposes the new stone is eminently suited.

The want of such a material for such a purpose has long been felt, although that want, until recently, has only been partially supplied. In 1870, Mr. J. W. Butler applied for and obtained a patent for improvements in the application of concrete to structures and foundations, also to cofferdams and similar constructions. Mr. Butler's obvious desire was, in the first place to provide a cheap and efficient substitute for stone for hydraulic operations, and in the second, to render unnecessary the construction of false works, &c., and thus to avoid the expense connected with the employment of iron cylinders, hitherto so extensively used. The idea was certainly an excellent one, but its realisation appeared to Mr. Butler very remote, until it occurred to him that the material then introduced under the name of "apœnite" would answer the purposes of his proposed methods of construction. He accordingly communicated with the author upon the subject; and with the sanction of the engineer a set of hollow cylinders, 8 ft. in diameter and 9 in. thick, were made to form part of a retaining wall to protect the foreshore of the Thames at Hermitage Wharf, where they were accordingly sunk, and the result was satisfactory.

The arrangement proposed for economically carrying out this class of work is as follows:—A timber staging is erected, upon which the materials may be mixed and moulded, the moulds consisting of an inner and outer framing, the space between the two forming the mould for each ring of a cylinder or hollow block, as the case may be. The courses are joined by means of a cement formed of similar materials to that of which the rings or blocks are composed. These are lifted from the staging on which they have been made, and lowered into position by an overhead traveller or crane, as may be most convenient. The lowest course is chamfered, as shown in the diagram, and when necessary from the nature of the soil, may be shod with iron. The operation of sinking is carried out generally in a precisely similar manner to that adopted with iron cylinders. The horizontal joints are made with alternate projections and depressions, and the several courses are connected vertically by dowel piles, which also serve as guides in sinking the work.

The application of this principle is capable of modification to suit almost every variety of construction, and it would be found especially applicable in structures requiring heavy foundations, particularly where the ground is uncertain.

For forming a face-wall in building quays or docks, instead of cylinders, rectangular hollow blocks or caissons may be used. By employing hollow blocks of hexagonal form, no interstices are left, a thin layer of the cementing material rendering the structure practically homogeneous. Cylinders constructed upon this principle are also adapted for deep wells, apertures being formed in the sides for the admission of water.

Turning to works of greater magnitude, it will be seen that apœnite forms a suitable substance for the construction of bridges, sea-walls, piers, and similar undertakings. The structure could be carried up to the underside of bridge girders, or built with ordinary masonry above high-water level. For sea-walls or piers, the arrangement given in the previous paragraph could be adopted. Here two rows of caissons are employed, separated from each other longitudinally, the intermediate space being filled in with dry rubble hearting, and the blocks themselves with a similar material, or, if necessary, with concrete.

In the case of an embankment for a reservoir, the heart of the bank, which is usually made with a puddle wall, is proposed to be substituted by two rows of cylinders, the contained spaces being filled in with puddle, and the cylinders themselves with material similar to that of which the bank is made. In sinking the cylinders, they would be carried some distance below the natural surface, so as to obviate any chance of leakage below. Should a leak occur above, it could be only to a very small extent, as it would be prevented from extending by the proposed structural arrangement. It is obvious that this plan could, without much difficulty, be applied to embankments already constructed where there was reason to apprehend that any settlement had occurred. By sinking the cylinders from the top through the puddle-bank, but without removing any of the slope on either side, they would be carried down to sound ground, rendering the embankment safe, and removing all fear of danger in the future.

It would not be difficult to multiply the instances in which this material can be practically applied; but sufficient has been said on this point. An artificial stone, combining the advantages of apœnite,—one, moreover, which can be so readily moulded into any form and size with but small expense and little or no delay,—is necessarily applicable to a great variety of uses. The author will therefore only briefly remark upon its applicability for ornamental and decorative purposes.

Besides possessing the several properties which have been described, the apœnite, when prepared with suitable materials, is capable of receiving the most delicate impressions, and, by the incorporation of various metallic oxides, any variety of colour can be imparted to it.

By the use of the native red oxide of iron, manganese, and other mineral substances, artificial marble and granite of almost every description can be produced. These artificial stones, like their originals, are capable of taking an excellent polish, are extremely hard, and can be readily moulded into the most elaborate forms at a very small cost.

A LARGE CHIMNEY.

On reading a paragraph in the *Builder*, a fortnight ago, under the above heading, I was astounded to find the statement that the shaft, containing over 1,000,000 bricks, 620 tons of stone, &c., cost but a little over 2,000*l.* As I have just prepared an estimate for a somewhat similar one (but circular), I cannot but think there is a mistake as to cost of "a large chimney," and write to ask you to insert this letter in your paper in the hope that the builder may read it, and take the trouble to set the matter straight, or it may tend to mislead as to the real cost of high shafts. T. L.

*** The Cannah's Quay Chemical Company, for whom the chimney was erected, inform us, on inquiry, that the cost was but a little over the sum named, 2,000*l.*

A LESSON FOR ARTIZANS.

At a time like the present when there is a general movement on the part of artizans throughout the country to raise the prices of manufactured commodities or of emigrating to other places where wages are much higher than at home, the following facts, which are well authenticated, concerning the printing trade in the United States, whither many of our printers are now proceeding, may be usefully digested, not only by the class concerned, but by persons engaged in all other businesses. The employing book-printers of New York are all complaining of the want of remunerative work, and there is scarcely an office in the city that has not material enough to do thrice the work that is done; the types and men are idle half the time. A reduction of wages has been partially acted on, but it is not enough to meet the views of publishers. They get the work done in interior and eastern cities and villages. But this competition is not so menacing as that of Europe. When the price of labour began to rise in the United States, buyers went abroad to seek advantages they could not get at home. They found that in England labour could be had at half the American rate; in Holland and Germany at nearly a third of the prices. The result was a transfer to foreign printers of a large proportion of the work. It now pays an American printer to have his books made in England, and one of the largest houses is negotiating for the establishment of a printing-office in London. Several others are making preparations. The offices which have initiated this experiment of foreign manufacture deliberately decide to let a portion of their capital invested in printing machinery lie idle and to have their work done in offices abroad; and elect that it is the lesser evil to submit to the inconvenience of dependence on a manufactory three thousand miles distant. Even what is called "job" printing is not secure, and the cities of the United States are now canvassed by agents of foreign printers, chiefly French and English. One printing establishment in London has thirty machines in constant employment on American orders, and at the same time there are in America the skill, the men, and the materials lying idle that would do the work. At the present prices, however, they cannot be used. A large type-founding establishment in Edinburgh has just been bought by an American firm, and types can be manufactured there and sent over to the States with a saving of at least 30 per cent. on the home prices. These facts supply an admirable illustration of some of Mr. Lowe's remarks the other day at Glasgow.

STEPNEY JEWISH SCHOOLS.

These schools are curiously arranged. The approach is through a long, narrow playground and under an archway which has been formed beneath the upper part of an old house. By this contrivance, the accommodation contained in the seven rooms forming the upper part of the old house is retained as a master's residence, and a covered playground is formed where the ground-floor of the old house formerly stood. The new school building in the rear consists of a two-story building, each story 13 ft. clear in height. On the ground-floor is a girls' school, 34 ft. long and 21 ft. wide; and an infants' school, 23 ft. long and 21 ft. wide; and, on the first floor, a boys' school, 58 ft. long and 21 ft. wide. Attached to each floor are ranges of Macfarlane's sanitary latrines and lavatories, and the lobbies are fitted with the usual cloak-pegs. The buildings are so placed on the ground as to form a separate playground for girls and infants out of one portion of the site. The school buildings are lighted on three sides by ordinary lifting sashes, and the warming and ventilation are effected on Boyd's principle, by open grates placed in the usual fireplace openings, but with fresh-air external inlet gratings at back of stove, where the air, coming in contact with the stove, is warmed, and, rising, passes through an internal inlet grating along the top of the stove into the schoolrooms. The vitiated air is to be drawn out of the rooms up air-flues built in the brickwork close alongside the smoke-flues of the fireplaces, and separated from them by a thin iron flue division, which, becoming heated by contact with the smoke, causes an upward current in the air-flue of which it forms one side.

The new building will accommodate 280 children in all, and allowing 200*l.* out of the total amount of builder's contract for the work in altering the old house to form master's residence, the cost of the new school building will be about 1,260*l.*, viz., 4*l.* 10s. per child, exclusive of desks and forms, and curtains or movable partitions, which may perhaps bring the cost up to 5*l.* per child. The roof is formed with strong wall-plates, so that at any time if required it may be raised bodily by a few screw-jacks under the plates, and a new story inserted under it. The architects are Messrs. Davis & Emanuel, of London; and the builders Messrs. David King & Son, of Mitre-street, Aldgate.

LEAD *v.* ZINC.

A discussion took place last week at the Camberwell Vestry, respecting the roof of the new vestry-hall now in course of erection, and which will shortly be covered in. The point under consideration was the adoption or otherwise of an alternative estimate substituting lead for the roof of the new vestry-hall in lieu of zinc, involving an additional expenditure of 400*l.* The *Metropolitan* says,—The vestry-hall committee had recommended that the alternative estimate be not adopted. Several members contended that the expenditure of an additional 400*l.* in covering the roof with lead was altogether unnecessary, remarking that several of the large public buildings in the metropolis were covered with zinc, amongst others the Cannon-street and Charing-cross Hotels, and that what was good enough for those buildings

ought to be sufficient for their new building. On the other hand, it was urged that, as compared with lead, zinc was a perishable article, and that the wisest economy would be to cover the roof of the new building with lead, inasmuch as that zinc would have to be renewed, whereas lead would last for an indefinite period; and what was more, the lead would always be worth the money laid out upon it. The chairman said the committee had no feeling in the matter. The question was one entirely of expense, and, apart from that, there could be no question as to the superiority of lead over zinc. The vestry, by a large majority, ultimately decided that lead should be used for the roof instead of zinc; and it was also further decided, on a representation from the architect, that the figures and vases to be placed upon the balustrades and pediment of the hall should be carved in Portland stone instead of being executed in Portland cement. These two alterations will involve an additional expenditure of 450*l.*, and it was incidentally stated at the meeting that although the contract is for 8,000*l.*, the building will ultimately not cost less than 11,000*l.*

MONUMENTAL.

A number of gentlemen interested in the Liverpool Library have joined together to erect a monument in the Toxteth Park Cemetery, Smithdown-road, in memory of the late Mr. John Perris, who, for fifty-six years, was connected with the library. Mr. Heffer, architect, of Castle-street, was commissioned to prepare a design for the proposed monument, which was executed in stone by Mr. A. Norbury, sculptor, and a few days ago it was removed to its place a few yards from the principal entrance to the Cemetery. The architect has adopted the form of an ancient Roman altar, which is embellished and finished in an artistic manner. The monument is more than 3 ft. broad at the base, and stands 6½ ft. high. It is of grey Yorkshire stone, with a slab of red polished granite on the front containing an inscription in gilt letters. The base is deeply moulded, and the body of the monument tapers slightly to the entablature. On the frieze, and running round the four sides of the structure are the words "John Perris, died Jan. 22, 1872, aged 67 years," in raised Roman letters very bold in character. The enrichments of the entablature consist of a representation of a book-back and some ornamental work, the whole being surmounted with a book with its leaves thrown open, forming an ogee pediment.

COMPETITIONS.

Surrey New Church.—The committee for the erection of this building (Rev. Newman Hall's) have approved the general design as prepared by their architects, Messrs. Paull & Bickerdike, of London. It is intended to provide a church capable of accommodating 2,000 appropriated sittings, and a lecture-hall for 800 adults, with numerous vestries and class-rooms, and other apartments attached. The style adopted is English Gothic of the Geometrical period, and the structure will be faced with stone throughout. At the point of junction of the Westminster and Kennington roads, a tower and spire will be erected about 200 ft. high.

WOOD PAVEMENT AND ASPHALTE.

It appears that the London Tramways Company refuse to lay down the Val de Travers asphalte opposite the British Home for Incurables in the Clapham-road, on the ground that it would be very dangerous both to the company's horses and the general driving public to lay down asphalte on so steep a gradient. It further appears that the Val de Travers Asphalte Company themselves object to lay their asphalte on a steeper gradient than 1 ft. in 60, on account of its slippery nature, and that the London Omnibus Company, who provide horses for the Tramway Company, refuse to carry on their contract if asphalte is laid down, but that they are willing to lay down granite setts in the part of the road in question, if the Board will agree to it. After a discussion on the subject, the Board (Wandsworth) decided to lay down wood pavement along that portion of the roadway above named.

The fact is not to be blinked, that under certain conditions roads laid with asphalte become unusable. To be precise, on Saturday morning (September 28th) the whole of the City traffic where asphalte prevailed was conducted at a walking pace: any attempt at more rapid locomotion would have resulted in a fall. This we saw and avouch. The effect of this sudden pull-up on all sides was most singular: the loss of time provoking.

ANTS, &c.

Sir,—I sympathise very much with those of your correspondents who are troubled with ants, beetles, and other vermin in their houses. Without doubt, such a state of things is a very great nuisance. I do not think, however, that they are to be got rid of by means of any of the remedies "C. H." copies from the *Times*. These appear to me to be only "sops to Cerberus." The evil is much too serious to be played with in that way. My plan would be to do that which vermin eminently *dislike* (to use the phrase of "A London Householder"), viz., *stop them out*. I should take up the whole of the floors, skirtings, &c., of the infested rooms, and take out the grates or ranges; then well pun or ram the earth below, and on this lay down a Portland cement concrete floor, 2 in. thick at least, which, if finished smooth on the top surface, would be a most excellent substitute for flagging, being without joints, and perfectly even. Carry the flooring into the chimney-breast, so as to form a good back hearth, and well render the fireplace opening throughout with cement and sand, 1 to 4, up to the gathering over for flue. Run cement skirtings all round the rooms of a good depth, and reset the grates or ranges, and I venture to affirm, from much experience, that the remedy will be complete. Wooden floors may be laid over the concrete floors if desired, as the rooms will be perfectly dry.

E. G.

SCHOOL BOARDS.

Llanaelhaiarn. — The Llanaelhaiarn School Board has appointed Mr. Walter W. Thomas, architect, Liverpool, as their architect, and have accepted his design for a school and master's residence submitted in competition, which will be carried out under his superintendence without delay.

OPENING OF MACCLESFIELD INFIRMARY.

This new edifice, we are glad to observe, has at length been devoted to its intended purpose, as we strongly urged it ought, and was opened as an Infirmary on the 2nd instant, with appropriate ceremonial, by the Lord Lieutenant of the county.

The foundation-stone of the building was laid on the 8th of August, 1867, by Earl Grosvenor, now Lord Westminster. The entire building, exclusive of site, the laying out of grounds, &c., will cost about 18,061*l.*, the whole of which has been raised by donations and subscriptions. The endowment fund bequeathed by the late Mr. Tunnicliff and the late Dr. Swanwick now amounts, with the accumulations, to a total of 33,000*l.*

The building stands pleasantly in close contiguity to the Public Park, over which there is a fine view from the western wing of the building; and the roads which have been opened up around it since the adaptation of the site make it convenient of access from all parts of the town.

The infirmary is built upon the Pavilion principle as our plan and view in last year's *Builder*, pp. 706 and 707, will show.

The style is Italian, but with limited pretensions to ornamentation. The prominent feature is the façade of the principal entrance, which is carried up in clustered columns and pillars. This entrance, which is approached by a grand flight of stone steps, in three tiers, is protected by a porch colonnade in keeping with the entire front. The centre block is surmounted by clock-tower and spire, rising to a height of upwards of 100 ft. from the basement, the towers being fringed with ornamental ironwork. The whole is built of stone from the Tegsnose Quarries, with finely-worked ashlar facings from the Windaway Quarries.

The grounds in front are to be ornamentally laid out, and encircled with wall and palisadings, in accordance with the design shown in the engraving.

The architect for the building is Mr. James Stevens, of Macclesfield and Manchester, and the work throughout has been executed under his superintendence by Messrs. R. Neill & Sons, of Manchester, the principal contractors. The sub-contractors are Mr. Charles Frith, of Macclesfield, for the stonework; Mr. Robert Davies, Macclesfield, plumbing and glazing; Messrs. Kitchen & Brown, Manchester, for the inside iron work; and Mr. Best, of Manchester, for plastering and painting. The joiners' work throughout has been done by Messrs. R. Neill & Sons. The floors are of pitch-pine, to be polished with bees-wax. The internal hot and cold water apparatus, electric bells, gas-fittings, grates, and mantelpieces, fire-plugs, and hose, &c., have been supplied by Mr. William Wilson, of Manchester; all the above being under Messrs. Neill & Co.'s contract.

The institution starts with a total of thirty-nine beds, and to this extent the infirmary is furnished.

BUILDING WITH BITUMEN.

Sir,—My attention has just been called to the two letters in your impressions of 28th ult. and 5th inst. in reference to the above subjects. It reply to the former by "A Builder," it is evident from his remarks that he has not even read the memoranda from which he quotes, or he would perceive that the walls therein compared are of 14 in. and 9 in. work respectively, which at once disposes of his argument respecting the "difference in the thickness of the joints." Next, as to "combustibility." "A Builder" quotes "Muspratt" to prove that because pure bitumen will melt at 284° Fahr., the *composition* which I use would be equally affected. And here again his logic and chemistry are equally at fault. Would he tell us, for example, that because hydrogen gas is highly imflammable, so is water?

Moreover, the furnace referred to is *not built of fire-brick*, is still in use, and open to "A Builder's" inspection. I may further state that insurance companies in London are prepared to grant policies on all buildings constructed on my system.

Referring to the number of bricks which can be laid by one man per diem, I am prepared to supply "A Builder" with men, each of whom, paid as per rates quoted, will lay more than the number I have stated, and I am open to take contracts based on the figures referred to.

In conclusion, taking "A Builder's" figures for a basis, I find that the profits on "*half a million of pounds*" (which he quotes as "a large part of all that is done in this country"), taken at 10 per cent., would be 50,000*l.*; and this sum, divided among the 1,400 builders in London alone, would give each the "*magnificent sum*" of 36*l.* per annum.

Need I comment further upon a "A Builder's" figures?

In reference to "An Engineer's" remarks respecting my patents, I presume the Attorney-General is quite able to substantiate the views he took of them, which have since been fully corroborated by the highest professional authorities.

"An Engineer's" remarks on my "Tube Wells" are so clearly expressive of vindictive feeling, that I hope he may be induced to unmask, and if he will favour me with his name and address I shall be happy to furnish him with thousands of references both at home and abroad as to the effective working of what he is pleased to call my "dangerous pump," and the introduction of which to the townspeople of England he looks upon as a "pestilent thing."

I presume my *friend* never indulges in that universal beverage, *bitter ale*, or is unaware that Messrs. Allsop & Co., of Burton-on-Trent, use thirty-two of my tube-wells for the supply of water for their brewery!

J. L. Norton.

THE NEW LICENSE ACT AND SANITARY REFORM.

A provision in the new License Act, empowering magistrates and the police to suspend or refuse licences to public-houses that are out of repair or not in a good sanitary state, is now being put in force in the county of Durham, and the readers of the *Builder* will perceive from the following shocking statement that it was time some remedy was applied to alter a state of things which is a disgrace to civilisation.

At a recent Petty Session at Castle Eden, a district dotted all round with collieries and mines, Superintendent Scott handed the following to the magistrates:—

"To the Magistrates in Brewster Sessions, assembled.

Gentlemen,—According to your request, I, accompanied by Mr. Barker, your clerk, have made a careful inspection of alehouses licensed for the sale of intoxicating liquors within the Castle Eden Petty Sessional division. The houses undermentioned, in their present state, are so strictly unfit for public-houses, that I would recommend the Bench to temporarily withdraw the licences until the owners met the requirements of the Bench.—I am, gentlemen,

Percival Scott, Superintendent of Police.

J. Cook, innkeeper, of Hutton Henry, bad stable, coach-house, and back premises in bad repair. James Hunton, innkeeper, house out of repair. William Wilson, inkeeper, of Sheraton, roof of house bad; no 'convenience' or coach-house. John Pattinson, innkeeper, of South Wingate, convenience and stable out of repair. Thomas Dixon, of Trimdon, six entrances to his house. Mark Hogg, of Trimdon Colliery, neither urinal nor convenience. James Hamson, of Trimdon Colliery, house in bad repair. Valentine Hamilton, innkeeper, Trimdon Grange, convenience not satisfactory; no urinal; stable in bad repair. James Arrowsmith, of Thornley, back premises in bad repair. Isabella Walker, innkeeper of Thornley, no convenience. George Freeker, no convenience. Thomas Watson, innkeeper, Castle Eden Colliery, no convenience. William

Herricks, no convenience, and house out of repair. Thomas Humphrey, Wingate, house and back premises out of repair. James Scott, Wingate, no urinal or convenience. George Campbell, Shotton Colliery, no back convenience, and place in bad repair. Francis Smith, Shotton Colliery, no convenience. Mary Day, innkeeper of Haswell, stable and convenience out of repair. Thomas Webb, of Haswell, no convenience. William Richardson, South Hetton, no ash-pit or convenience, and place out of repair. William Lawson, innkeeper of South Hetton, no convenience. Benjamin Dobson, of Blue House, four rooms and passages out of repair. David Hutchinson, Wingate-lane, no convenience or ashpit, back premises out of repair, and unfit to retain a spirit licence."

The landlords of the above disgraceful houses were called before the magistrates, the Rev. William Mayor and Mr. Stephen Robinson, and having promised to make their places decent, the bench allowed the owners and occupiers a certain amount of time, failing which, the licences would be refused. In several of the cases the houses were owned by wealthy brewers and distillers; and it appeared that scarcely a miner's cottage in the district had any sanitary accommodation, and those occupied by the agricultural labourers are in the like uncivilised and dangerous condition.

The action taken by the Castle Eden magistrates is being followed up in the other divisions, and, incredible as it may appear, even Castle Eden district proves to be better off than several other places in North and South Durham.

The writer, who has recently been in the north, and who is well acquainted with other counties, can state that so far as sanitary measures and decent dwellings are concerned, the north of England is as primitive and disgusting as Caffre land, and in no other part of England is such a fearful state of things to be found.

The want of water is universally complained of in Durham.

THE BUILDING TRADES MOVEMENT.

London.—Mr. M'Clymont, of the firm of Corbett & M'Clymont, last week told a deputation that his firm would pay each man such a price as they thought he was worth. Some of their best men were paid 8½d. per hour, and some less; but they declined to be compelled to pay 8½d. per hour to the men all round, when many of them might not be worth more than 6d. or 7d. per hour. He regretted to lose so many of his old workmen through the strike, but he had no offer to make to them, as he had the full number of men he required. The men on strike held a meeting, when they denied that they either claimed or expected the firm to pay 8½d. per hour to every mechanic on the works. All that they contended for was that the firm, like other master builders, should recognise 8½d. per hour as the standard rate of wages, and to be given to those men in the firm who were considered worth that sum by the foremen. A deputation was appointed to wait upon Mr. McClymont, and the interview took place on Friday, when Mr. M'Clymont consented to pay 8½d. per hour to all efficient skilled workmen. We understand, however, that the firm were able to take back very few of the old hands, having already as many as they needed. —— On Saturday night a meeting of the Carpenters' and Joiners' Delegates, elected to secure uniformity of time and wages in the London district, on the basis of the agreement entered into with the Master Builders' Association, was held at the Brown Bear Tavern, Bloomsbury. The number present scarcely reached twenty-five. It was resolved to wind up the business, and terminate the movement. Mr. Matkin, the secretary, estimated they had received and paid away during its progress 7,100*l.*; and now everything was paid for with the exception of printing the balance-sheet, which would be ready for issue in nine or ten days.——At a meeting of masons on Thursday, it was resolved to resist an application from the Master Builders' Association, asking the men to conform to the regulations made with other branches of the building trade, namely, to work till one o'clock on Saturday instead of twelve during the winter months, and accept 9d. per hour for overtime instead of time and a half, viz., 1s., as settled in the late agreement at the close of the strike.——A few days since 110 masons in the employ of Messrs. Jackson & Shaw, of Earl-street, Westminster, turned out because the firm would not discharge a man, named Day, who was said to be a spy and an informer, and to have made mischief between the masters and the men. Messrs. Jackson & Shaw deny that the man had ever given them any information, but have discharged him, and, as this was all the men required, they resumed work.

Hull.—The joiners' strike at Hull, which has lasted thirteen weeks, has been brought to an amicable termination. The wages of skilled workmen are to be at the rate of 6¾d. per hour. The working time is to be 53 hours for 40 weeks in the summer, and 47 hours for 12 weeks in the winter each year. The men resume work at once.

Paisley.—A difference has arisen between Mr. William Gillespie, of Paisley, and a number of men employed by him in the slating trade. Mr. Gillespie has had in his employment several men not connected with the union for a length of time, and he was informed one morning lately that unless he immediately dismissed one of them, who had rendered himself obnoxious to the society, all the members of it who were working for him would strike. Mr. Gillespie declined to dismiss a good and faithful workman at the dictation of the union, and those connected with it at once left his service. Some four years ago Mr. Gillespie successfully resisted a similar attempt to control his business.

THE LAND QUESTION.

Sir,—Mr. Stubbings fails to catch the spirit of my proposal when he compares it with the scheme of the M.P. (Fergus O'Connor, I presume) set forth twenty-four years ago, and which has been largely developed by various land and building societies since. These deal with *freehold* land, which they buy out and out, and on which they erect dwellings for their shareholders; most of whom are several degrees removed from the *working-with-the-hands class*, which I desire to benefit.

My proposal is to *rent on long leases* parcels of land of from three to ten acres each, according to the number in the occupying family, or the ability of the lessee to cultivate the same. The landlord to erect on each plot a decent dwelling-house and outhouses, with a good large barn, and keep the same in repair.

This land question has become so pressing that it will not matter much in what part of Great Britain the land is situated, provided it be accessible by a decent road, and of fair average quality; but poor land need not be neglected, as its poverty would be considered in the rent, and under spade cultivation its condition would soon be changed. "The wilderness would blossom as a garden."

The great superiority of a leasehold over a freehold holding lies in this, that a poor man may enter upon the land at once, with nothing but tools and seed, to which his labour and that of his family are to give value, and his yearly rental is only the interest of the money value of his holding; whereas in purchasing the freehold by a society he will not only have to wait a long weary time before he can get possession, but having to pay principal with his yearly interest will so cripple his resources, that in very many cases there will be a break-down in the attempt. E. G.

RISKS FROM FIRE IN CHURCHES.

With reference to the fire at Canterbury Cathedral, Mr. Richard Coveney, of Canterbury, who states that he has had many years' experience in the metropolis, principally in connexion with works executed for the Corporation of the City of London, suggests to those engaged in such work as the roofs of churches and other important public buildings that they may not only lessen but obviate the risk of fire by using coal instead of charcoal. It is an ascertained fact, he remarks, that in blowing the charcoal to make hot metal, the sparks in windy weather are uncontrollable, and consequently great risk is incurred by such a process. He would submit that a safer plan would be thus:—Use a coal fire; let the "devil" stand in a sheet-iron safe, large enough for the fire-basket, with about 3 in. depth of water at the bottom. By this plan the coal-embers must drop into the water, and be rendered innocuous. During many years' employment on the corporation works, he says, he practised this process without the slightest dangerous results. As to the risk to churches and large buildings from the liability of the warming apparatus to become overheated, and thus tend to the destruction of the entire fabric, he suggests an arrangement by which, he says, danger may be obviated. It consists of a mechanical contrivance acted upon by electricity. Upon the apparatus becoming heated beyond a given point, a bell is instantly and loudly rung, and the precise spot where the overheating occurs is indicated. This alarum may be communicated not only within the building itself, but at any distance from it, and at any number of places at the same moment. Another great source of danger, he adds seems to be generally overlooked, in the modern practice of fixing gilded metal finials on roofs of buildings, without attaching any efficient means of conducting into the earth the electricity which they attract. These ornamentations might be rendered efficient lightning-conductors, and thus supersede the necessity of the ordinary appliances of that nature.

CHURCH-BUILDING NEWS.

Rocester.—The Church of Rocester, near Uttoxeter, the state of which had long been bad, has recently been almost completely rebuilt, and it has been reopened for divine worship. The services of Mr. Christian, of London, were secured as architect, and his designs have been carried out by Mr. Fern, of Leicester. Nothing now remains of the old church except the tower, and this has been capped by a spire, the battlements and base being also renewed. The restored structure consists of tower, nave and south aisle, chantry, and vestry. The style is Early English. The chantry is divided from the vestry and the nave from the south aisle by four arches, the pillars of which are of Devonshire marble, with foliaged capitals. The roof of the church is open-timbered. The pews are in the modern style, and will seat about 420 persons. The flooring is of encaustic tiles, supplied by Mr. R. M. Taylor. The east window represents scenes in the life of our Saviour. This is the gift of Mr. C. M. Campbell. It was from designs by Mr. de Morgan. The communion-table, of inlaid wood, is the gift of Mrs. Dawson, of Barrow-hill. It was designed by Mr. Christian, and made by Mr. Stubbs, of Denstone. Another of Mr. Campbell's gifts is the organ, built by Messrs. Foster & Andrews, of Hull. The font and pulpit are of Bath stone. The entire cost of the restoration is upwards of 4,000*l.* Mr. Campbell, besides 1,000*l.* to the church, has given a valuable piece of land as an addition to the graveyard, and had it laid out and fenced at his own expense.

Illingworth.—The ancient church at Illingworth has been reopened for divine service. In the spring of the present year the edifice was temporarily closed for restoration. The primary object of the present restoration was to remove the old-fashioned high-backed square pews. The modern style of seats now introduced are of pitch-pine, and fill the body of the church, consisting of two groups, with a partition running midway, the seats being entered from the nave, and the north and south aisles. In the gallery, the vacancy made by the removal of the orchestra has been filled in with seats, uniform with the rest, and the oak gallery-front considerably lowered, and the superfluous coating of paint and varnish removed. The painting and decorating were undertaken by Mr. Binns, of King's-cross. The eastern wall is decorated with a design of the *fleur-de-lis* as a ground-work. On each side of the east window is a piece of scroll-work, bearing texts. The decoration of the ceiling consists of a design of fourteen circles, twelve of which enclose escutcheons bearing the badges or emblems of each of the twelve Apostles, and the two remaining circles, north and south of the centre, enclose a second circle, bearing respectively the *fleur-de-lis* or the lily and the rose. Each of these fourteen circles, forms the centre of a design, which extends the length and breadth of the ceiling, the whole having for its centre an oval-shaped artistic centrepiece. The reredos occupies one-third of the east end. It is divided into three parts, by coupled and carved capitals and marble columns, each side compartment formed into panels. The pulpit, the gift of Miss Moss, of Field Head, is (like the reredos) executed in Caen stone, by Mr. Charles Mawer, of Leeds. The organ has been removed to the south-east angle of the chancel. It has been recased in pitch-pine, with music-board and front of American walnut, and several improvements have been introduced. For these alterations it has been in the hands of Messrs. Ratcliffe & Sagar, Leeds. The pipes for the introduction of gas are now laid, in anticipation of gas being this winter

supplied to the village. The gasfitting has been done by Mr. J. Holdsworth, Halifax. An extensive heating apparatus, on the hot-water principle, has been supplied and fixed by Mr. Thornton, of Huddersfield. There yet remain to be erected three stained-glass windows (not yet complete), by the same friends who contributed to the adornment of the building, viz., the Holdsworth family, of Shaw Lodge, Halifax; and a fourth window (not yet completed) is presented by Mrs. T. Hartley, of Taunton. The recent improvements have cost over 1,000*l*.

Whitby.—All Saints' Church, at Ugglebarnby, near Whitby, has been re-opened. Before commencing the present new church, it was intended to restore the ancient church to something like its twelfth-century condition; but upon close examination it was found that nothing remained to show what the building had formerly been, and that the only traces of an old Norman church were the columns of the chancel-arch and a few disjointed stones, all of which have been preserved in the new building. The style of architecture adopted in rebuilding is thirteenth-century Gothic. The church was at first intended to be finished in a plain and similar manner; but, through the liberality of the Allan family, the interior has assumed an elaborate appearance, which will be more apparent when the whole is completed. The several works have been carried out from the designs of Mr. Chas. Noel Armfield, York diocesan surveyor, and architect, Whitby, and under his superintendence by local tradesmen. ——The Bishop of Ripon has consecrated a piece of ground recently added to the churchyard, Aldborough, near Boroughbridge. The newly-added ground, provided by the burial board, is situate on the west of the church, and was formerly gardens and ground occupied by cottages. It has been cleared and trenched, and surrounded by a wall, with entrance-gate. The newly-consecrated piece will provide burial sites for 228 adults and 262 infants.

Tryddyn.—A movement, with the restoration of the parish church here for its object, has been in contemplation for some time past, and with the view of initiating it, a vestry meeting was convened at the National School-room, and it was then resolved unanimously,—"That this meeting having fully considered the architect's report on this church, together with the sketch-suggestion of a new church, pledges itself to use every effort to carry out the proposed undertaking." A Church Building Committee was named, and a subscription list opened.

FROM SCOTLAND.

Partick (Glasgow).—The new town-hall and burgh buildings of Partick have been opened. The buildings are situated near to the public road, in Maxwell-street, to which they present a frontage of about 130 ft. There are two entrances from that street, the main one opening into a corridor which runs from the front to the back of the building, separating it into two wings. On the west side of the corridor is the Town-hall, with retiring-rooms for ladies and gentlemen. The hall is in extent 75 ft. long by 50 ft. in width, and the ceiling rises to a height of 45 ft., the roof being supported by open semi-circular iron-bound couples or joists. At one end of the hall is a platform, and at the other end, and also round the sides of the hall, is a gallery. Behind the platform an organ has been erected, built by Mr. Connacher, of Huddersfield. To the east of the corridor, on the ground floor, are the Commissioners' room and a committee-room, while to the back of the building, also on the ground-floor, are the hall kitchen, in which preparations can be made for entertainments in the hall, and the hall-keeper's house. On the second floor of the eastern wing is the lesser hall, which is 38 ft. long by 26 ft. in width. The architect of the buildings is Mr. Leiper, of Glasgow. The foundation-stone was laid on the 12th of March, 1871. At the front of the building are several sculptured figures done by Mr. J. Young, of Glasgow.

Books Received.

General Conference of Architects, 1872. *Report of Proceedings.* No. 9, Conduit-street.

We need only mention that a report of proceedings at the last General Conference of Architects has been published by the Institute, and is now obtainable at their rooms. It gives the papers and reports read, and the result of the discussions, but not the discussions themselves. We observe, with regret and wonder, on the cover and on the title-page this threatening intimation:—"N.B. The copyright of these papers is reserved." Under a wiser policy, we should read in its stead:—N.B. Journals of all kinds, and in all countries, are earnestly requested to reprint such papers and statements herein as they may find worthy of additional publicity.

The Proportions of the Human Figure, as handed down to us by Vitruvius. With Outlines by Joseph Bonomi. Roberson & Co., Long-acre. 1872.

In the third edition of this curious and interesting *brochure* Mr. Bonomi gives Leonardo da Vinci's translation of the passage of Vitruvius in question, with an English version of it, and an additional plate, showing the difference in width between the male and female figures. Tried by the ancient standards, a truly fine female form is a rarity in England.

VARIORUM.

"A Summary of the Principles of a Comprehensive Measure for the Improvement of the Sanitary Laws. By Henry W. Rumsey, M.D., &c. London: Ridgway." This paper, by Dr. Rumsey, late Crown member of the General Medical Council, and an honorary member of the Metropolitan Association of Medical Officers of Health, was intended for perusal at the Social Science Congress, but the author was unable to attend. It is brief and comprehensive, and is well worthy of consideration with a view to more complete legislation on the subject.——"The Public Health Act, 1872, with special reference to Plymouth, Stonehouse, and Devonport. By Christopher Bulteel, F.R.C.S. London: Churchill." This paper was read at the Plymouth Congress of the Social Science Association, as already noted in the *Builder*. The author is surgeon to the Royal Albert Hospital at Devonport.——"Examples of Conics and Curves. By the Rev. W. H. Laverty, M.A. London: Rivingtons." The author of this pamphlet is a Fellow and Mathematical Lecturer of Queen's College and Public Examiner in the University of Oxford. The examples are of course illustrated with diagrams of curves and conics.——The *Garden* says, one of the most singular consequences of the late war has been the addition of a number of new plants to the Flora of the environs of Paris. The numbers of species found since the siege, which were before unknown there, amounts to 190. Of these, fifty-eight belong to the *leguminosæ*, thirty-four to the *compositæ*, thirty-two to the grasses, and sixty-six to other families. The seeds of these plants were for the most part conveyed in the forage of the French troops who were recalled from Algeria, Italy, and Sicily. Three kinds only appear to have been brought by the Germans, viz., *Vicia villosa*, *Stenactis annua*, and *Lepidium perforatum*. In other parts of France a similar result has been observed wherever there had been an encampment of troops. Should the Algerian and other plants thus introduced into so many parts of the country succeed in establishing themselves, it is obvious that in a few years the Flora of France will have to be re-written.——The "Household Edition" of "David Copperfield," by Charles Dickens, just now issued by Chapman & Hall, is a marvel of cheapness. It is full of illustrations, some of them very good. The book itself we have always held to be the most charming of the author's creations.

Miscellanea.

The Polytechnic College.—The Polytechnic College (formerly the Polytechnic evening classes) has been formed for the purpose of giving a more permanent and influential character to the course of instruction long carried out at this Institution, under the management of the Rev. C. Mackenzie, M.A. At several meetings which have been held by the promoters, it has been resolved to give to the classes a corporate form, consisting of a president, vice-presidents, a council, members, and students. The college has for its object the interests of the middle classes, both ladies and gentlemen, during their evening leisure, and consequently has very great claims on the attention of those who desire to repair defects in their early education.

Artistic Training.—Professor Poynter, in his address as Slade Professor, University College, dwelt upon the higher position of foreign artists as regards technical excellence, and the amazing facility with which French or German artists combined unity of effect and even thoroughness of execution in carrying out large and small works alike. That was the result of the system of constantly working from nature, which, giving but a limited time for the completion of a study, obliged the student to work in the simplest and most straightforward manner. That system he had introduced into those schools with the object of obviating as far as possible the timid and unmethodical style of work which seemed to be the prevailing fault in our exhibitions. With a view to encourage a good style of work he wished to direct students where to look for examples for imitation. Although following pretty closely the French system, he did not consider that the result at which French artists arrive was by any means to be held up for imitation. They did not make that use of their technical facility which should be the aim of a true artist. The skill of French artists was almost entirely due to that thorough training and constant study of nature which all French students received, and it was their fault or misfortune if they could not derive a better result from their studies. To that system he should adhere, believing that the unmistakable English love of nature would lead English students, under the same system, to a much higher result. To that love of nature, however, there must be added an appreciative love which is capable of selecting what is worthy of imitation, and setting aside what is unimportant. Looking at the English pictures of the present day it would be found that this point was the one in which they were most deficient. The sort of execution which passed current popularly now was generally of the flimsiest kind, the latest fashion being to make a picture somewhat resemble the wrong side of a piece of worsted work.

Foundation for Carriage-ways. — The Liverpool Corporate authorities are trying an experiment in North John-street of laying the street with a concrete foundation, overlaid with sets, the joints of which are filled up with asphalte. The cost is considerably over that hitherto incurred in making street-foundations and laying the sets; but it is confidently expected that, where heavy traffic prevails, this will be amply repaid. The concrete consists of five parts of gravel to one of Portland cement. This concrete is laid upon a thin layer of broken stones,—similar to macadam,—a layer of these stones and a layer of concrete following each other in succession until the desired height,—about 9 in. or 10 in.,—is reached. As each layer is put on, the workmen beat it in, and the result is a firm, homogeneous mass of concrete, the proportions of which are about eight or ten of gravel and stone to one of Portland cement. As soon as this portion of the work is completed the sets will be laid over the concrete. These will be about 6 in. deep, and from 3½ in. to 4 in. broad, and the joints will be firmly secured by asphalte being poured in between the interstices, into which there will previously have been brushed clean dry gravel. By this means it is hoped to make the surface impervious to water, and to confine the wear and tear of the street to the sets themselves, without at all interfering with the stability of the foundation underneath.

Removal of the Dead under the Union of City Benefices Act.—"A City Incumbent," writing to the editor of the *City Press* anent the cost of working the above Act, instances the cases of St. Benet, Gracechurch-street, and St. Mary Somerset, and says,—"The removing the dead from these two churches only (observe, not from the churchyards, but only from under the floor of the churches) has cost 4,949*l*. 6s. 7d. Surely an Act of Parliament which cannot prevent such extravagant charges as these needs to be amended or abrogated."

Encroachments on Greenwich Park.—A deputation has waited upon the Right Hon. G. J. Goschen at the Admiralty to protest against the letting for building purposes of certain land contiguous to Greenwich Park, and at one time forming part of the park. Mr. Goschen, after listening to the arguments of several members of the deputation, said the matter should have the best consideration of the Board of Admiralty, to see by what means they could comply with the wishes of the inhabitants.

Experiments with "Lithofracteur."—A series of experiments with an explosive material known by the name of Lithofracteur, have been made on the Minehead Railway, not far from the town of Watchet. There were present as spectators, Sir Alexander Acland Hood, bart., and eldest son; Mr. F. Fox, C.E. (engineer of the Bristol and Exeter Railway); Mr. W. Dennis, C.E. (engineer of the Minehead Railway); and others. The patentees and manufacturers are Messrs. Krebbs, Brothers, & Co., of Cologne, represented on this occasion by Mr. Oliver Kirkman, assisted by Mr. G. H. Daw, London (inventor of the central-fire gun and cartridge), and Mr. F. Hawkins, of Tintinhall Court, who conducted the proceedings. This material has for a considerable time, it is said, been used in foreign countries, and by the Germans during the late war. It is composed of 50 per cent. of nitroglycerine absorbed in 25 per cent. of earth, and 25 per cent. of various chemicals, which it was said render it safe in transport, stowage, and every-day use. It is made up in the shape of cartridges, and its explosion can only be effected by a long percussion-cap, filled with detonating composition, fixed on the end of a time fuse, and then inserted in the cartridge and secured to its paper envelope. If brought into contact with a flame, it does not explode it seems, but merely burns away like rosin. Its power is said to be twelve times greater than that of gunpowder. As far as could be judged, the experiments were considered very successful, and of the safety of the material there is said to have been no question.

The Rateable Value of the Metropolis.—From an official return just prepared by the direction of the Hackney District Board of Works, it appears that the rateable value of the various districts and parishes within the metropolitan area is as follows:—Marylebone, 1,173,316*l.*; St. Pancras, 1,105,836*l.*; Lambeth, 770,000*l.*; St. George, Hanover-square, 1,241,180*l.*; Islington, 981,156*l.*; Shoreditch, 446,420*l.*; Paddington, 920,544*l.*; Bethnal-green, 275,508*l.*; Newington, 280,000*l.*; Camberwell, 380,000*l.*; St. James, Westminster, 513,156*l.*; Clerkenwell, 264,744*l.*; Chelsea, 326,972*l.*; Kensington, 816,308*l.*; St. Luke, 243,812*l.*; St. George, Southwark, 175,000*l.*; Bermondsey, 234,000*l.*; St. George-in-the-East, 234,000*l.*; St. Martin-in-the-Fields, 300,564*l.*; Hamlet of Mile-end Old-town, 255,552*l.*; Woolwich, 69,400*l.*; Rotherhithe, 126,000*l.*; Hampstead, 236,680*l.*; Whitechapel, 325,808*l.*; Westminster, 457,964*l.*; Greenwich, 334,990*l.*; Wandsworth, 584,220*l.*; Hackney, 570,788*l.*; St. Giles, 318,200*l.*; Holborn, 224,407*l.*; Strand, 315,524*l.*; Fulham, 279,560*l.*; Limehouse, 273,424*l.*; Poplar, 481,440*l.*; St. Saviour, 194,000*l.*; Plumstead, 205,084*l.*; Lewisham, 310,000*l.*; St. Olave, 141,000*l.*

North Oxfordshire Archæological Society. This society had an excursion on Wednesday, the 25th ult., under the guidance of the Rev. Philip Hookins. At Cropredy Miss Loveday and several other ladies enhanced by their presence the pleasure of the day. The first place visited was Horley Church. The Rev. W. J. Pinwill exhibited his collection of carved oak furniture, ancient china, Etruscan ware, Roman and Mediæval relics, including part of a pax, string of beads, &c. The large church of Hanwell was next visited. It is greatly in need of restoration. The remains of Hanwell Castle, now a dwelling-house, were thrown open to the visitors, by the kindness of Mr. French. A short halt was made by the excursionists at Great Bourton. At the Church of Cropredy the visitors heard from Dr. Wood a *resumé* of the secular history of the church and its appurtenant chapelries; and at the historic scene of Cropredy Bridge the same gentleman explained the position of the rival forces who met there on the 29th of June, 1644. Miss Loveday exhibited a gilded whistle, which was dug up on the site of the battle. A large yew-tree in the garden of the Vicarage at Cropredy attracted attention. A dinner, of which eleven guests partook, at the White Lion Hotel, Banbury, was the immediate precursor of the breaking up of this friendly gathering.

Hindoo Temple in London.—Canon Trevor, writing in the *Record* on the controversy between the Archbishop of Canterbury and "the heathen," says:—"I learn from Professor Garcin de Tasey's 'Revue Annuelle of Hindustani Literature for 1871' that there is actually a subscription on foot in Bombay to build a pagoda in London for the worship of Vishnu and Siva."

Inhabited Houses in London.—A statistical report from the Joint Parliamentary Committee of the Hackney District Board of Works has been issued, showing the progress made by the several parishes and districts under the jurisdiction of the Metropolitan Board of Works. By this it appears that the number of houses in the parish of Marylebone at the end of the last official year was 16,328; St. Pancras, 24,079; Lambeth, 29,123; St. George, Hanover-square, 10,425; Islington, 27,083; Shoreditch, 15,624; Paddington, 11,832; Bethnal-green, 15,981; Newington, 12,545; Camberwell, 17,755; St. James, Westminster, 3,381; Clerkenwell, 6,808; Chelsea, 8,989; Kensington, 15,492; St. Luke, 5,871; St. George, Southwark, 6,903; Bermondsey, 10,624; St. George-in-the-East, 5,924; St. Martin-in-the-Fields, 2,083; Hamlet of Mile-end Old Town, 13,037; Woolwich, 4,670; Rotherhithe, 3,934; Hampstead, 4,340; Whitechapel, 8,313; Westminster, 6,531; Greenwich, 16,170; Wandsworth, 19,091; Hackney, 19,355; St. Giles, 4,541; Holborn, 3,748; Strand, 3,271; Fulham, 10,177; Limehouse, 7,789; Poplar, 16,259; St. Saviour, 3,716; Plumstead, 7,960; Lewisham, 8,271; St. Olave, 1,764.

Light from Air charged with Mineral Oil Vapour.—A renewed endeavour to bring this sort of light into use is being made. The air appears to be driven by bellows through the liquid "gasogen" and stored in a gasometer for use. It gives a brilliant light, but we should fear it is apt to become deteriorated by deposition of the liquid again, if allowed to stand. Air itself stored in the gasometer, and only charged with the vapour on its way to the burners would seem to be what is requisite to obviate this in the use of such a light. As for its liability to produce explosions, it is said to be admitted that it ranks with ordinary gas in this respect. The light has been exhibited in a new building in Change-alley, Cornhill. At a subsequent meeting, Major-General C. Scott, at the request of the chairman, Sir John Murray, explained the patentee's invention, according to particulars afforded him by Messrs. Harrison. Mr. H. Child, he said, had analysed the gas, which, we may add, is free from the offensive contaminations of coal gas, and smells a little like ether.

"Testing" a Gas-holder.—An accident has occurred to the new gas-holder at Hollinwood, belonging to the Oldham Gas and Water Works. The holder, which had been erected by Messrs. Mahon & Co., Ardwick Iron Works, Manchester, was considered complete, and the other day arrangements were made for "lifting" or testing it before it was formally handed over to the corporation. Mr. Mahon had promised to be present; but before either he or any one connected with the committee had arrived, a person connected with the building in course of erection took upon himself the task of testing the gas-holder. He accordingly set the engine to work; but instead of forcing air into the holder, he reversed the machinery, and, as a consequence, the air already inside began to become exhausted. In a short time the gas-holder gave way, under the force of the atmospheric pressure, and, in addition to a good deal of damage being done to the roof, a number of rods bolts, &c., were snapped and bent.

Railway Matters.—A contract has been recently entered into by the Crown agents for the Colonies on behalf of the Government of Natal, for the construction of 345 miles of railroad in that colony. The Colonial Government, when the requirements of the contract have been fulfilled, is to pay the company a subsidy of 40,000*l.* per annum for twenty years, and to make a grant of 2½ million acres of land. The latter is subject to the condition that the company introduce, within a certain time, 7,500 immigrants.——It is stated that since the arrival of the Japanese embassy to England a contract has been made by Messrs. Brassey & Co. for the construction of a railway from Yokohama to some distance in the country, and that a good deal of the plant will be constructed at Manchester, and the Canada Works, Birkenhead.

Builders' Reponsibilities.—A case has just been tried in the Clerkenwell County Court (Barford *v.* Bishop) in which 100*l.* damages for loss of services were sought to be recovered from a builder, on the ground that his servant threw a piece of lime into the eyes of the plaintiff's son, and injured his eyesight. The judge nonsuited the plaintiff, as there was no evidence against the defendant.

Mr. Emerson.—Mr. Edmund Waldo Emerson, son of the well-known American author, has written to the *Pall Mall Gazette* in the following terms:—"My attention has been recently called to a paragraph that appeared in your journal a short time since stating that subscriptions would be received from the English friends of Mr. Ralph Waldo Emerson for the purpose of rebuilding his house, by Mr. Hilliard, of Boston. Will you kindly allow me to state through your columns that I know that while my father would gratefully recognise the kind thought that prompted such a call, he would be extremely sorry to know that it had been made? Immediately after the partial destruction of his house by fire a number of his near friends in America kindly insisted upon taking upon themselves the cost of restoring it, and by the new year it will be finished and much improved. As my father knows nothing of the paragraph to which I have alluded, I feel called upon to make this statement for the benefit of his friends among your readers."

Good Advice.—At the opening meeting of the Working Men's College, Great Ormond-street, a word of good counsel was given by Mr. Cave Thomas, in a letter excusing his absence, which may be usefully repeated. Addressing Mr. Rawlins, the secretary, he begged that his congratulations might be given to Mr. Mark Carey, who has won high honours as an art student, and has rendered good service as an elementary teacher. Mr. Thomas said,—"Mr. Carey's work is a very remarkable exemplification of what may be accomplished in leisure hours. It exhibits not merely the mechanical results of industry, but great artistic feeling and power; that degree of ability, indeed, which might fairly tempt the possessor to make art a profession. Mr. Carey has decided, however,—I think wisely—to make art a work of love, and the recreation of his leisure. This, too, is an example needed very much in the present day, when anybody who is able to scratch upon paper some resemblance to an object forthwith determines that art is his vocation."

St. Leonard's Tower, Bridgnorth.—At a meeting of the Building Committee last week it was decided that the architect's original design in regard to the tower should be carried out *in toto*, and that the spire should be erected. The extreme width of the tower is 41 ft. 6 in., and this additional feature will make the entire height 122 ft., as the spire will rise 23 ft. from its springing, and 14 ft. 6 in. above the top of the finials of the present pinnacles. The work is being proceeded with. Mr. Harry Hems, of Exeter, has modelled a half-sized figure of St. Leonard, as a model for the statue of the patron saint, which is designed to occupy a niche, 47 ft. from the ground, immediately over the large window on the south side. St. Leonard is represented in the simple garb of a religious recluse. Its niche is to be carved. The rest of the carved work upon the outside and inner part of the tower, under Mr. Hems's supervision, is progressing.

Carlisle Gas Works.—The new gasholder erected at these works has been completed. It is a telescopic holder, and is erected in the same tank in which a single gasholder was erected in 1852, and which has now been replaced by the present one, in consequence of the increased consumption of gas. The new gasholder is 83 ft. in diameter by 46 ft. in height, its cubical capacity being about 250,000 ft., or double that of the former holder. Special means have been taken to secure the safety of the holder by the use of diagonal rods between the columns. The gasholder has been erected at the cost of about 3,000*l.*, by Mr. Daniel Howard (late B. Whitehouse & Co.), West Bromwich, near Birmingham, from specifications prepared by Mr. J. Hepworth, manager of the works.

Dante's House.—Dr. H. L. Barlow, writing to the *Athenæum*, says:—"By a letter just received from a devoted admirer of Dante, now in Florence, Colonel Gillum, I learn that the poet's house in his native city is allowed to remain in the same disgraceful state to which it was reduced a few years ago, without anything having been done to restore it, or to effect those renovations which had once been proposed. 'The windows are still out, and the house has the appearance of having been gutted, and is looking utterly neglected.' These are the Colonel's own words, and they correctly describe the state in which I found it when last in Florence, in 1869. The only parts uninjured are the arch over the door and the inscription."

Settlement of the Coventry Sewage Question.—At a recent meeting of the Coventry City Council, it was unanimously resolved "that the draft lease to the General Sewage and Manure Company, Limited, of the sewage works, sewage messuage, and 28 acres of land at Whitley, agreed upon between the Sewage Committee and the Company, be approved." The mayor congratulated the council and the city generally upon the prospect of seeing this difficult question settled not only without incurring the enormous expense that was laid before them at [previous meetings by Mr. Hawksley's plans, but, as Mr. Franklin had said, without any expense at all. He believed it was the determination of the company to make the system a success in Coventry, and a place that they might refer to in future.

The Sewage Question at Dover.—Alderman Finnis appears to have been successful in convincing the town council of the necessity of doing something in connexion with the sewage outfalls, of which serious complaints were made some time ago by the military authorities. At a recent meeting of the sewer outfall sub-committee of the council, Mr. Hanvey's plans for taking the sewage through a tunnel in Shakspeare's Cliff were examined and approved, and the co-operation of the War-Office authorities was invited. The minute was confirmed at the meeting of the managing committee, and the War Department will be asked to pay a share of the expenses of the works. The estimate is 10,000*l.*

Damage to Leeds Bridge.—A recent storm of wind and rain which swept over the country caused the river Aire to be very much swollen, and three coal-barges upon it broke from their moorings, and were carried down the current, coming in contact with Leeds Bridge. One of them was dashed against the new structure, and sank immediately; and another came so violently in contact with one of the piles supporting the temporary bridge that it was rendered unsafe, and all vehicle-traffic across it was stopped. Buildings in course of erection also suffered somewhat during the storm. A portion of a house which was being built by Mr. Dyson, of Carlton Mount, behind Cromer-terrace, was blown down.

Arrival in New Zealand of Brogden Workmen.—The *Marlborough Press*, a New Zealand newspaper, announces the arrival of the first batch of emigrants sent out by Messrs. John Brogden & Sons to work upon the New Zealand railways, as already spoken of in the *Builder* of the 28th of September. As to the attention to the wants and comforts of the immigrants on landing, the New Zealand paper says:—

"We cannot conclude without giving a word of praise to J. Brogden & Sons, for providing so well and amply for the housing and accommodation of the new arrivals. There was no hitch, no hurry, no disarrangement of plans; and everything worked so harmoniously that the men, women, and children were conveyed without delay from the steamer in which they arrived to the houses prepared for them, in which cheerful fires were burning, and provisions in quantity stored. The thoughtfulness of somebody in having lighted fires deserves mention, as the warm glow must have felt to many like an hospitable welcome to the land of their adoption."

Chelsea.—The Chelsea Vestry have under consideration a proposal to borrow about 8,000*l.* to cover the expenses of putting in brick sewers in the following streets, &c., at present served with pipe-sewerage more or less defective:—Limerston-street, 720*l.*; Victoria-grove, 600*l.* 10s.; Camera-square, 692*l.* 15s. 6d.; Radnor-street, 510*l.* 5s.; Shawfield-street, 540*l.* 6s.; Manor-street, 1,563*l.* 14s.; Godfrey-street, 621*l.* 7s.; Cadogan-place (north end), 720*l.* 4s.; Wellington-street, 520*l.* 6s.; Collingwood-street, 520*l.* 6s.; Arthur-street, 240*l.* 10s.; College-place, 350*l.* 16s.; Upper Manor-street, 529*l.* 9s.; being a total of 8,531*l.* 8s. 6d.

Oban Church Competition.—The committee appointed to make a selection from the thirty-four plans that were received in connexion with the proposed new church, have decided upon the design of Mr. David Thomson, of Glasgow. The proposed edifice will cost about 3,000*l.*, and is to be proceeded with at once.

A Local Museum for Newington.—At a vestry meeting in Newington, Mr. Malthouse has proposed that a portion of the waste space in the vestry-hall be turned to the uses of a local museum, where the antiquities of the parish may be exhibited for the inspection of ratepayers and others.

The Holborn Valley Improvements.—It is stated that the Improvement Committee of the Corporation are able to show that no expense has been incurred by the Holborn Valley Improvements—that they have been paid for (with 100,000*l.* to spare) by the improved value of the land which they caused to be vacant.—*City Press.* [We shall be glad to find this confirmed. At present we must be permitted to doubt.]

The Darlington Fever Hospital.—At a meeting of the Darlington Town Council, held on the 3rd inst., the report of the Hospital Committee was adopted, and it was resolved to erect the building forthwith, at a cost of 9,000*l.* The architect is Mr. G. G. Hoskins, of Darlington, to whom the first premium was awarded in March last.

"£22,000 for a Ceiling."—The paragraph thus headed, which has been circulated with reference to works in course of execution by Messrs. Cubitt & Co., for the Marquis of Westminster, under Mr. Henry Clutton, architect, is a fabrication. There is no mahogany nor ebony in the ceiling: it is of Jackson's composition, gilded. The doors and shutters are of mahogany.

Sale of Rosherville Gardens.—This property was submitted for sale by auction by Mr. Samuel Green, of the firm of Green & Son, on the 8th instant. The biddings commenced at 15,000*l.*, and the hammer fell at 24,600*l.*, at which sum the auctioneer declared the property to be sold. The hotel adjoining was sold separately.

Fire in the Theatre Royal, Cambridge.—A fire broke out the other evening at the Theatre Royal, Cambridge, soon after the performance commenced, whereby the "flies" were all destroyed. The fire, however, was discovered in time to prevent further damage. A similar fire occurred there last year.

TENDERS

For one pair of semi-detached villa residences on the Tramway Estate, Brixton-rise (No. 2 design), for Mr. W. Everett. Messrs. Goulty & Gibbins, architects:—

Rowe & Verran (accepted)	£1,071 0 0

For boundary enclosure to St. Stephen's Church, North Bow. Messrs. Tolley & Dale, architects:—

Scrivener & White	£456 0 0
Perry & Co.	447 0 0
W. & D. Brown	436 0 0
Browne & Robinson (accepted)	373 0 0

For the erection of stables, cart-shed, &c., for the Corporation of the City of Lincoln. Messrs. Bellamy & Hardy, architects:—

Taylor	£620 0 0
Young	595 0 0
Crossby & Sons	589 0 0
Hallam & Co.	572 0 0
Slingsby	563 0 0
Barnes & Wright	551 0 0

For building the Public Elementary School, in Newroad, Buckland, for the borough of Portsmouth School Board. Mr. Thos. Hellyer, architect:—

Evans, Brothers	£3,850 0 0
Burbidge	3,500 0 0
Light, Brothers	3,459 0 0
Quick	3,439 0 0
Ward	3,397 0 0
Barnes & Moody	3,200 0 0
Eades	3,195 0 0
Morsy, jun. (accepted)	3,165 0 0
Smith	3,150 17 0

For additions and repairs to Stacie's Farm-house, Manningtree, Essex. Quantities by Mr. Ormes:—

Canham	£488 0 0
Saunders & Son	467 0 0
Capon	463 10 0

For certain repairs to Bootmakers' Asylum, Mortlake. Quantities not supplied:—

Fish	£225 0 0
Pathley	209 10 0
Hart	179 0 0
Pride	165 0 0
Bowling	135 0 0
Aries (accepted)	130 0 0

For taking up roads and laying pipe-sewers, for the Watford Local Board:—

Hubbard	£999 0 0
Capper	960 0 0
Pizzey	939 0 0
Free	899 18 0

For laying a pipe-sewer for the Acton Local Board:—

Stiggs	£177 0 0
Nave	141 5 0
Elliott	136 0 0
Hubbard	133 5 0
Godair	128 12 0
Pizzey	124 0 0

For farm-buildings at Shenley, Herts, for Mr. W. Edwards. Mr. A. King, architect:—

Cordell	£490 0 0
Adams & Co.	470 0 0
Cooke & Groome	464 0 0
Boyce	408 0 0

For lodge and farm-buildings, at the Ridgeway Oaks, Enfield, for Mr. F. S. Foley. Mr. Thomas J. Hill, architect:—

Field & Sons	£758 0 0
L. & W. D. Patman	647 0 0
Bayes & Rammage	590 0 0
Ward	565 0 0
Childs	531 0 0

For works in connexion with additions and alterations to Derwent Lodge, Kensington. Mr. T. Lawrie, architect. Quantities by Mr. H. P. Foster:—

Stimpson & Co.	£2,780 0 0
Macey	2,162 0 0
Hibbins & Tresler	2,121 19 6

For Turnpike House public-house, at Stamford-hill. Mr. R. Button, jun., architect. Quantities by Mr. W. H. Barber:—

Emery	£2,250 0 0
Lewis	1,931 0 0
Child	1,890 0 0
Rist & Brown	1,827 0 0
Marr	1,752 0 0
Linsell	1,747 0 0
Jarvis	1,687 0 0

For four shops at Brixton, for Mr. H. W. Nevill. Messrs. Habershon & Pite, architects:—

Adamson & Sons	£3,190 0 0
Woodward	3,150 0 0
High	3,070 0 0
Ritson	3,025 0 0
Temple & Foster	3,024 0 0
Chessum	3,010 0 0
Morgan	2,995 0 0
Hiscock	2,815 0 0
Haynes	2,738 0 0
Tongue	2,559 0 0

For five houses, Lowdon-road, Brixton, for Mr. H. W. Nevill. Messrs. Habershon & Pite, architects:—

Temple & Foster	£2,374 0 0
Woodward	2350 0 0
Adamson & Sons	2,349 0 0
High	2,330 0 0
Ritson	2,297 0 0
Chessum	2,245 0 0
Tongue	2,117 0 0
Hiscock	2,115 0 0
Morgan	2,100 0 0
Haynes	1,739 0 0

For offices for the Phœnix Gas Company at their works at Greenwich. Messrs. Church & Rickwood, architects. Quantities supplied:—

Jerrard	£979 0 0
Shuttleworth	914 0 0
Colls & Sons	897 0 0
Johnson	880 0 0
Garland	850 0 0
Tongue	830 0 0
Kirk (accepted)	744 0 0

Repairs and alterations to premises, Little Moorfields, for Mr. Ball. Mr. Hill, architect. Quantities not supplied:—

Turner & Son	£267 0 0
Lark	253 0 0
Bridgman, Nuthall, & West *	248 0 0
Bevan & Lynn	245 10 0

* Accepted.

For new storm relief line to Fleet sewer. Mr. J. W. Bazalgette, engineer:—

Anderson & Dunmore	£81,300 0 0
Bloomfield	81,000 0 0
Neave	79,500 0 0
Mowlem & Co.	75,000 0 0
Pearson	73,000 0 0
Ritson	72,900 0 0
Webster	72,500 0 0
Groom	69,400 0 0
Jennings	66,900 0 0
Pickering	65,999 0 0
Bridgman, Nuthall, & West	65,729 0 0
Williams & Co.	64,500 0 0
Newell & Robson	62,977 0 0
Wall	54,600 0 0

For alterations and additions to "The Brewers," St. Pancras-road. Mr. Ansell, architect. Quantities not supplied:—

Langmead & Way	£356 0 0
Bridgman, Nuthall, & West	349 0 0

Oval-road Schools, for Croydon School Board.—Sir: In reference to the published list of tenders, we beg to state that we did not withdraw our tender, but were invited to send an amended tender with Messrs. Waterson & Co.:—

Amended Tenders.

Peskett & Taylor	£3,120 0 0
Waterson & Co.	3,010 0 0

Original Tenders.

Peskett & Taylor	£2,961 0 0
Waterson & Co.	3,045 0 0

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London, October 9th, 1872.

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Applications, stating age and previous occupation, with recent testimonials, must be sent to me on or before TUESDAY, the 30th day of OCTOBER inst. Canvassing the Guardians in any way is strictly prohibited, and any candidate, either by himself or his friends, pursuing such a course, will be deemed disqualified. Any further information may be obtained on written application to me.
By order of the Board,
THOMAS J. HOOPER, Clerk.
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